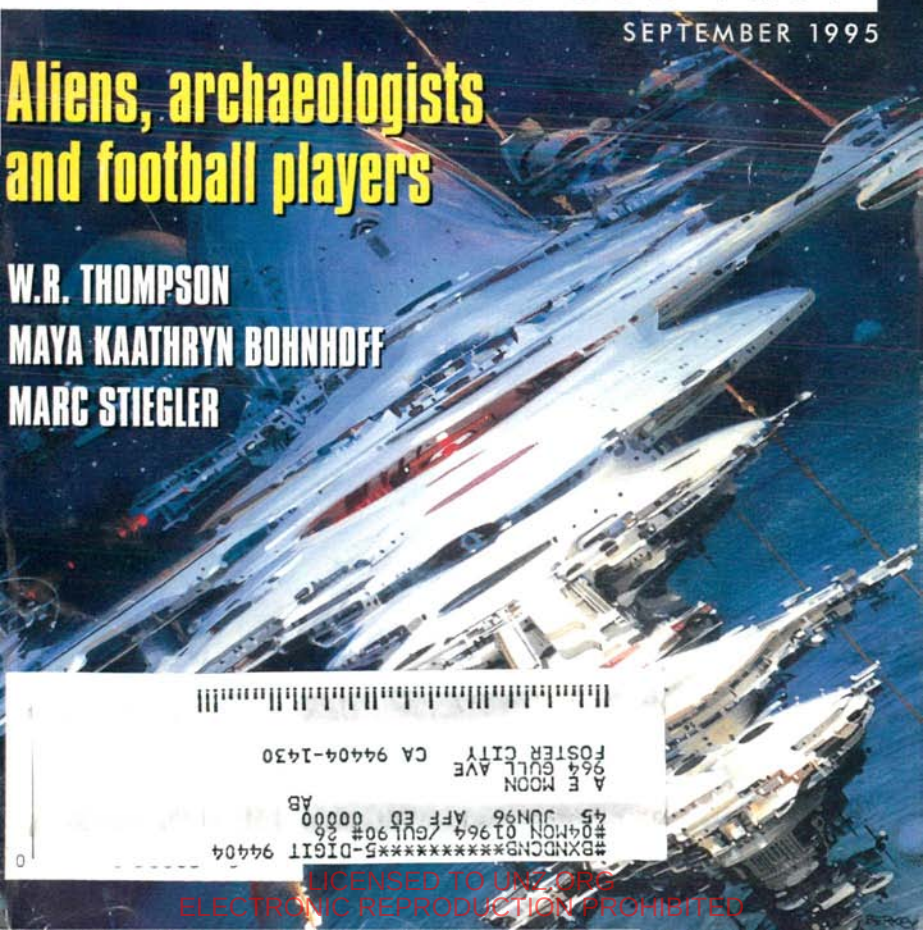
# ANALOG®

## SCIENCE FICTION AND FACT

SEPTEMBER 1995



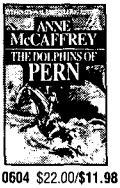
## Aliens, archaeologists and football players

W.R. THOMPSON
MAYA KAATHRYN BOHNHOFF
MARC STIEGLER

#BXNDCNB**********5-DIGIT 94404
#04MON 0196 4 /GUL90# 26
45 JUN96 APF ED 00000
AB
A E MOON
964 GULL AVE
FOSTER CITY CA 94404-1430

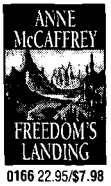
LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# THEORETICAL REALITIES REVEALED!




**0604** $22.00/**$11.98**

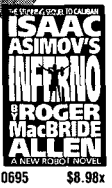
**6916** **$12.98x**



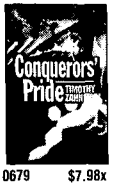

**0166** 22.95/**$7.98**

**0968**◊$21.95/**$7.98**

**1065** $20.00/**$9.98**




**0695** **$8.98x**




**0679** **$7.98x**

**0422*** $26.95/**$14.98**

**0380*** $26.95/**$12.98**

**1214** $22.00/**$10.98**

**1222** $19.99/**$9.98**

**1149** $25.95/**$12.98**

**1008*** $23.95/**$11.98**

**0893** $20.95/**$10.98**

**1164**+$22.00/**$10.98**

**0638**+ **$9.98x**

**8680** $13.95/**$6.98**

**1206** $22.95/**$8.98**

**1073** $18.95/**$8.98**

**1313** $22.95/**$7.98**

**1198** $23.95/**$11.98**

**1180** $22.95/**$10.98**

**1396** $16.95/**$7.98**

**1115** $19.95/**$6.98**

**1248** $21.00/**$9.98**

**1537** $24.95/**$11.98**

**1255*** **$8.98x**

**5595** All 5 novels plus *The Foundling & Other Stories* $83.70#/**$14.98**

* Explicit scenes and/or language x Hardcover edition exclusively for Club members # Combined publishers' editions
+ ™, ® and © 1995 Paramount Pictures. All Rights Reserved. STAR TREK is a Registered Trademark of Paramount Pictures.
◊ ™, ® and © 1994 Lucasfilm Ltd. (LFL) All Rights Reserved. Used Under Authorization.
Prices in fine print are publishers' hardcover editions. **Prices in bold print are Club hardcover editions.**

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# TAKE 5 BOOKS FOR $1 with membership

**60** *Woundhealer's Story, Sightblinder's Story, Stonecutter's Story*
$45.85#/**$12.98**

**5017** *Farslayer's Story, Coinspinner's Story, Mindsword's Story*
$50.85#/**$12.98**

**4903** *Wayfinder's Story, Shieldbreaker's Story*
$38.90#/**$10.98**

**7609*** *The Book of the Damned, The Book of the Beast*
$39.90#/**$10.98**

**5264*** *The Book of the Dead, The Book of the Mad*
$39.90#/**$10.98**

**8383** *The Memory of Earth, The Call of Earth, The Ships of Earth*
$66.85#/**$14.98**

**1354** *The Infinity Concerto, The Serpent Mage*
$24.95#/**$11.98**

## HERE'S WHAT YOU GET WHEN YOU JOIN...

**A GUARANTEE OF SATISFACTION.** Once your membership's accepted, we'll send your 5 BOOKS and FREE MICHAEL WHELAN PLAYING CARDS. If you're dissatisfied with the books, return them within 10 days *at our expense.* Membership will be canceled; you'll owe nothing.
**HUGE DISCOUNTS ON HARDCOVER BOOKS.** Save as much as *65% off* publishers' edition prices. Club books are sometimes altered in size to fit special presses.
**THE FREE CLUB MAGAZINE.** You'll receive up to 16 issues a year. Each reviews the Featured Book Selection(s) plus dozens of alternate books.
**SHOPPING MADE SIMPLE.** To get the Featured Book Selection(s), *do nothing*—it will be sent automatically. If you prefer another book—or none at all—return your Member Reply Form by the specified date. A shipping and handling charge (and sales tax, where applicable) is added to each order.
**AN EASY-TO-MEET OBLIGATION.** Take up to 2 years to buy 4 more books at regular low Club prices. Afterwards, you may resign membership anytime.
**RISK-FREE RETURN PRIVILEGES.** If you get an unwanted book because your Club magazine was delayed and you had less than 10 days to respond, simply return the book *at our expense.*

**FREE MICHAEL WHELAN PLAYING CARDS with membership**

THE Science Fiction BOOK CLUB®

**MAIL TO:** *The Science Fiction Book Club*
6550 East 30th Street, P.O. Box 6367
Indianapolis, IN 46206-6367

Please write book numbers here:

**YES!** Please enroll me in *The Science Fiction Book Club* according to the risk-free membership plan described in this ad. Send me the 5 BOOKS I've indicated—plus my FREE MICHAEL WHELAN PLAYING CARDS. Bill me just $1, plus shipping and handling.

**SAVE EVEN MORE!** Send me this book now and reduce my commitment to 3 books. Bill me an added $2.98, plus shipping and handling.
(write book number)
67106 71

72

Mr./Mrs.
Miss/Ms. _____
(please print)
Address _____ Apt. _____
City _____ State _____ Zip _____

If you're under 18, your parent must sign here: _____

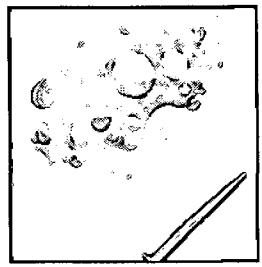
**Members accepted in U.S.A. and Canada only.** Canadian members serviced from Canada, where offer is slightly different. Sales tax added where applicable. We reserve the right to reject any application.

ANA 9/95

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# ANALOG

SCIENCE FICTION AND FACT



82 65

Vol. CXV No.11
September 1995

Next Issue on Sale
August 15, 1995

**Novellas**

TOUCHDOWN, TOUCHDOWN, RAH, RAH, RAH!,
W. R. Thompson ____ 12
THE SECRET LIFE OF GODS, Maya Kaathryn Bohnhoff ____ 120

**Novelette**

THE CHRONOLOGY PROTECTION CASE, Paul Levinson ____ 100

**Science Fact**

ESCAPE FROM LEO: AN OPTION FOR THE 1990s,
Gregory L. Matloff ____ 65

**Short Stories**

BEN FRANKLIN'S SPACESHIP, Joseph J. Lazzaro & Peter L. Manly ____ 75
KATH IN WINTER, Marc Stiegler ____ 82

**Reader's Departments**

THE EDITOR'S PAGE ____ 4
THE ALTERNATE VIEW, G. Harry Stine ____ 96
THE REFERENCE LIBRARY, Tom Easton ____ 160
IN TIMES TO COME ____ 167
BRASS TACKS ____ 168
UPCOMING EVENTS, Anthony Lewis ____ 176

Cover design by Terri Czeczko
Cover art by John Berkey

**Joachim P. Rosler**
President and Publisher

**Stanley Schmidt**
Editor

**Tina Lee**
Senior Managing Editor

**Terri Czeczko**
Art Director

PRINTED WITH SOY INK

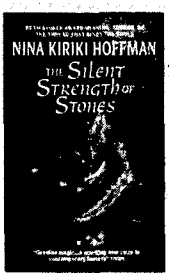
Indicia on Page 5

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

## PENDRAGON
by Stephen R. Lawhead

The acclaimed author continues his bestselling series, *The Pendragon Cycle*, with the volume four, *Pendragon.*

"Though Lawhead brilliantly creates an authentic and vivid Arthurian Britain, he never forsakes the sense of wonder that has graced the Arthurian legend throughout the ages." — *Publishers Weekly*




## THE SILENT STRENGTH OF STONES
by Nina Kiriki Hoffman

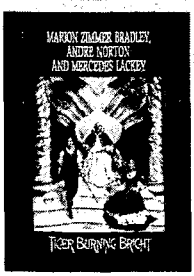
Nina Kiriki Hoffman, winner of the Bram Stoker Award for Best First Novel for *The Thread that Binds the Bones* and a Nebula Award-nominee, comes back with another contemporary tale of Powers and Presences.

"Hers is a startling new voice in contemporary fantasy, and her novel possesses the qualities of genuine magic." — *Locus* on *The Thread that Binds the Bones*

## CLD (COLLECTIVE LANDING DETACHMENT)
by Victor Milan

A tough, fast-moving military SF novel by the author of *Cybernetic Shogun* and *Cybernetic Samurai.*

---




## TIGER BURNING BRIGHT
by Andre Norton, Marion Zimmer Bradley and Mercedes Lackey

This epic collaboration from three of the brightest lights in fantasy shows powerful women using magic, deception and misdirection to fight an all-conquering Emperor.

**An AvoNova Book/William Morrow Hardcover**

**Coming in September 1995**

AVONOVA

AVON BOOKS
The Hearst Corporation

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# DEDICATION

People often react more to words than to the concepts they represent. Thus a word can practically glow with such warm, noble connotations that those using or hearing it may not notice that it's hiding insidious pitfalls.

Take, for example, "dedication," a word that fills most of us with admiration for those we believe to have it. The dictionary tells us it means self-sacrificing devotion to something, such as an ideal, a career, or a goal. Sometimes, though, it's little more than a euphemism for "overspecialization," and its main effect is to keep people from thinking about the risks that implies.

We often hear a dedicated artist, for example, praised in such terms as, "His life is his work." Think about that. If his life is his work, and he loses the ability to do that work, what's left of his life? A person with a variety of interests is far less vulnerable to the loss of any one of them. If you *like* something so much you want to spend all your time and energy on it, you're lucky to have found even one thing that makes you that happy. But it's risky to put all your eggs in one basket, no matter what kind of eggs and basket you're talking about.

Enough people get away with it to help keep alive the attitude that "His life is his work" is a Good Thing. The other thing that helps keep it alive, of course, is that *other* people benefit from it. It's true that a good many of the works which have most impressed people, and kept doing so for the longest periods, were produced by individuals who threw everything they had into one pursuit, such as musical composition or scientific research. People who reap the benefits seldom particularly care whether the people who made them possible had happy lives. So it often seems beneficial to most of us to encourage others who want to devote all their energies to a single thing.

Sometimes, though, it's not even in the best interests of the obvious beneficiaries, particularly when it's made a philosophy of management and imposed routinely on workers who may not want it. A good example that has come to my attention is a recent fad in the field of medical technology.

This piece is *not* about medical



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

technology; that just happens to be the source of my major example. To understand it, though, you'll need to know a little about how medical laboratories have tended to operate, and how many of them are trying to change that.

Medical labs do a wide range of diagnostic tests for doctors and hospitals in such areas as blood chemistry, hematology, urinalysis, cytology, and microbiology. Some are as small as a single technologist or technician working part-time doing a few tests during normal office hours for a doctor in private practice. Others may employ hundreds around the clock, either as part of a hospital or as an independent company to whom hospitals and doctors contract work.

Technologists and technicians differ mainly in the amount and kind of training they've received. Technologists typically are trained in all the areas I mentioned, and more, and may rotate among fields, working one day or week, in chemistry, and the next in urinalysis or hematology. The ability to do that has been important, especially in small to medium-sized labs, because of the nature of the work.

A hospital lab cannot take holidays or vacations—ever. Individual techs can—and they need them, since the work can be quite stressful—but virtually everything in a medical lab sometimes needs to be done on an emergency, right-now, can't-wait basis. (In the trade, they call that "stat.") Therefore somebody has to be available to do all kinds of tests at any hour or day or night, every day. Not *all* tests are stats, of course, so most labs are fully staffed only during normal business hours. Unpopular shifts with little except emergency work have a few people on duty, but just enough to cover the expected work load. A few people actually prefer working things like midnight shifts, which is convenient when you can find them. To the extent that you can't, everybody else has to take turns covering those shifts, whether through planned rotation or through "call."

Or at least, so it has been in most labs until recently.

Hold that thought while we turn to that management "fad" I mentioned. Lately it has become fashionable for labs to "departmentalize," that is, to separate the staff into subgroups of "dedicated techs," each of whom works always and only in a single department such as hematology or cytology. I've found it surprisingly hard

Analog Science Fiction and Fact (Astounding) is published every 28 days which includes special issues in January and July by Dell Magazines, a division of Bantam Doubleday Dell Magazines, at $2.95 a copy in the U.S.A., $3.75 in Canada. 1 year subscription for $39.97 in the U.S.A. and possessions, in all other countries, $49.97 (GST included in Canada, GST # 123054108) payable in advance in U.S. funds. First copy of new subscription will be mailed within eight weeks of receipt of order. When reporting change of address allow 6 to 8 weeks and give new address as well as the old address as it appears on the last label. Call 1-800-333-4561 with questions about your subscription. Second class postage paid at New York, NY, and at additional mailing offices. Canadian postage paid at Windsor, Ontario. Canada Post International Publications Mail, Product Sales Agreement No. 250622. © 1995 by Bantam Doubleday Dell Magazines, all rights reserved. Protection secured under the Universal Copyright Convention. Reproduction or use of editorial or pictorial content in any manner without express permission is prohibited. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. All submissions must be accompanied by stamped self-addressed envelope, the publisher assumes no responsibility for unsolicited manuscripts or artwork.

**POSTMASTER:** Send change of address to: ANALOG SCIENCE FICTION AND FACT
P.O. Box 5133, Harlan, IA 51593-5133.
IN CANADA RETURN TO: 3255 WYANDOTTE STREET EAST, WINDSOR, ONT. CANADA N8Y 1E9
**Editorial and Advertising: Analog Science Fiction and Fact, 1540 Broadway, New York NY 10036**
**Subscriptions: Analog Science Fiction and Fact, P.O. Box 5133, Harlan, IA 51593-5133 ISSN 1059-2113**
Printed in the U.S.A.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

to pin anybody down to a clear and convincing statement of the advantages of this arrangement. The best I've been able to come up with is a vague presumption that if people spend all their time doing the same thing, they'll become exceedingly good at it.

(Of course, it's a little hard to believe that this is *really* what departmentalizers have in mind when you consider that there's also a trend toward putting less trained, less experienced people on the benches and pushing the most trained, most experienced toward administrative positions. Which is, by the way, a good example of two deeply ingrained foibles in our culture. One is that most of us and our institutions have far more respect for *directing* work than for *doing* it very well, even though what really matters to the customer is the quality of the benchwork. The other is that when somebody does a job very well, this is taken to mean they should be doing something else. Think about it!)

Even if it's true that keeping people in one department makes them especially proficient there (and I'm not at all sure it is), I can see several *disadvantages* for everybody concerned: those who do the work, those who supervise it, and those who depend on the results.

The system can easily backfire on the management that introduced it by creating staffing problems that shouldn't exist. If a medium-sized hospital lab loses its only full-time midnight tech and has no willing


STANLEY SCHMIDT .....Editor
TINA LEE .....Senior Managing Editor
SCOTT L. TOWNER .....Senior Associate Editor
SHARAH THOMAS ..... Editorial Assistant
JEAN TRAINA ..... Vice President and Creative Director
TERRI CZECZKO ..... Art Director
ANTHONY BARI ..... Junior Designer
MARILYN ROBERTS .....Director of Production
CAROLE DIXON .....Production Manager
CYNTHIA MANSON .....Vice President of Subsidiary Rights and Marketing
CONSTANCE SCARBOROUGH .....Contracts Manager
BARBARA PARROTT .....Vice President of Single Copy Sales
BRUCE SCHWARTZ.....Vice President of Subscription Sales
DENNIS JONES .....Operations Manager Subscription Sales
JUDY DORMAN .....Advertising Sales Manager

Published since 1930

JOACHIM P. ROSLER
President and Publisher
Dell Magazines

FRED SABLOFF
Vice President &
Associate Publisher

JACK HOEFT
President and CEO
Bantam Doubleday Dell
Publishing Group, Inc.

ADVERTISING OFFICES
NEW YORK
(212) 782-8532

ADVERTISING REPRESENTATIVE
Dresner Direct, Inc., N.Y.
(212) 889-1078

First issue of Astounding
January 1930 ©

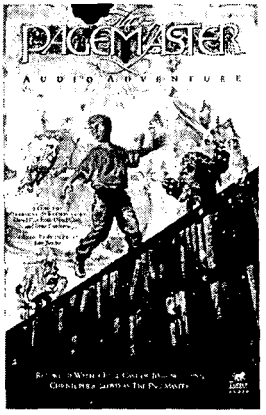



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# JOURNEY INTO MAGIC!

**DINOTOPIA AUDIO ADVENTURE**

Enter the enchanting land of Dinotopia where dinosaurs and humans live in harmony. Inspired by James Gurney's bestselling book *Dinotopia, The Dinotopia Audio Adventure* has been created on two audio cassettes. Join Arthur Denison and his son, Will, as they transport you to this unique utopia. Come along on this wonderful journey!




**PAGEMASTER AUDIO ADVENTURE**

Enjoy this classic, best selling volume as a spectacular audio adventure. Join young Richard Tyler on his amazing excursion in the library where he is plunged into a land in which the world's greatest stories come to life. This wonderful package offers almost two hours of entertainment. Also included is a ten-character cast headed up by Christopher Lloyd, one of the stars of Twentieth Century Fox's movie *The Pagemaster*. Listen for *The Pagemaster's* magic!

Please send me:

____ copies of *The Pagemaster Audio Adventure* @ $14.95 ($20.95 Can.)

____ copies of the *Dinotopia Audio Adventure* @ $14.95 ($20.95 Can.)

Please add $2.00 per item for shipping & handling. NYS residents add 8.25% sales tax..

Send to: **Turner Publishing, Inc., 420 Fifth Avenue, New York, NY 10018** Dept. 095AN

Name _____

Address _____ Phone _____

City _____ State _____ Zip _____


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

replacement waiting in the wings, it must temporarily cover that shift by making others take turns at it. Most will see this as something of an inconvenience, but something that they can endure and understand the necessity for—provided the inconvenience is distributed fairly and uniformly among the other employees.

In an "old-fashioned," non-departmentalized lab, this should pose no great problem. If nearly everybody is a generalist, everybody can handle a "do-it-all" assignment, and everybody can take an occasional turn at it so nobody has to take too many. But if everyone has been encouraged (or forced) to spend all their time in one narrow area, most of them will have largely forgotten the basic skills they learned in other specialties, and failed to learn new ones as techniques and equipment change. The lab will be full of people who are very good at chemistry but can't do hematology or urinalysis, others who can do hematology but nothing else, etc.

For the lab manager, this is a problem because specialization has made it harder than it should be to find people who are even *able,* much less willing, to fill an assignment that requires a wide range of skills. For the few techs who can, it's a problem because they find themselves under pressure to take a disproportionate share of the shifts that few people want. The only winners would seem to be the specialists who are saved by their own ignorance from having to work unpleasant shifts.

But even their victory is largely illusory. Times change, and for one reason or other many people sometimes find it necessary or desirable to change jobs. Will a person whose skills and experience are narrowly confined find as many options open as one who can do *many* things well?

Even if someone never changes jobs, and therefore has no concerns about the marketability of their skills, morale has an important effect on both performance and personal well-being of people *on* a job. The effects of specialization versus generalization, like almost anything else, will vary at least somewhat among individuals. I've already mentioned that specialists may feel a certain smugness about being exempted from unpleasant duties that require a generalist. The flip side of that is that the generalists who are *not* exempted may (quite rightly) resent having to take a disproportionate share of those duties. Workers disgruntled with the way they're treated are less likely to feel like giving their best efforts—and managers would do well to remember that they *need* generalists.

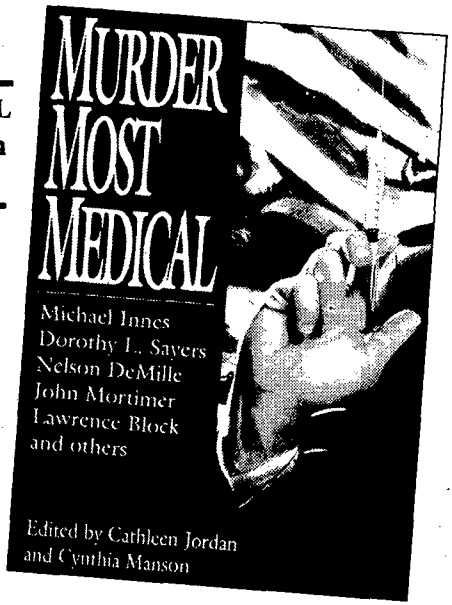
And then we come back to the question of whether specialization itself actually *is* conducive to people's doing their best work. Specialists may become extremely polished in a limited range of techniques, but they may also become bored with the repetition—and that can easily lead to laxness in attention to detail. Some people may find a well-worn rut more comfortable than exploring a new path, but I think most of us need change and variety to keep our minds and interests sharp. I base that claim both on observations and conversa-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# PRESCRIPTION FOR DEATH

**MURDER MOST MEDICAL**
**Edited by Cathleen Jordan &Cynthia Manson**




From Lawrence Block and Nelson DeMille to Dorothy L. Sayers and Arthur Conan Doyle, fifteen stories of crime in the world of the scalpel and the surgeon's mask are offered up for mystery lovers with a penchant for murder of the clinical kind. Lord Peter Wimsey, Dr. Daniel Webster Coffee, Dr. Plato Marley, and others guide readers through operating rooms, an anatomy theater, a blood bank, hospital hallways, autopsy labs, and into the esoteric possibilities of medical instruments capable of preventing death—or causing it.

---

Please send me _____ copies of *Murder Most Medical.* I enclose my check for _____ ($21.00 plus $2.50 for postage & handling for each copy). NY State residents: add 8.25% sales tax to your order. Send orders to: Dept. 095 AN , Carroll & Graf Publishers, Inc., 260 Fifth Avenue, New York, NY 10001.

Name _____

Address _____

City _____ State _____ ZIP _____

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tions with many other people, and from my own experience in several areas.

I remember, for example, the summer I worked in a small factory during college. Almost anything I did there—mostly highly repetitive things like running punch presses and spot welders of various sorts—might have driven me stark staring bonkers if I'd had to do it all day, every day, all summer. Fortunately my bosses had the good sense to teach everybody to do almost everything and then move them around. The fact that I seldom had to do the *same* thing for more than a couple of days at a stretch kept the whole experience endurable, and occasionally even interesting.

I realize, of course, that there are limits to how much generalizing can be done in a large, complicated, highly technical operation. Of course you can't expect everybody in an aircraft factory to do everything from design to assembly to bookkeeping to janitorial duties. In a hospital, doctors have to know a lot of things that med techs don't—and med techs have to know a lot of things that doctors don't. But it's neither necessary nor desirable, I think, to go to the other extreme and limit people to a small subset of what they *could* realistically learn and practice.

Maybe this is something that people periodically forget and have to relearn the hard way. I find it ironically fascinating that at the very time that medical *labs* are moving toward increased specialization, *doctors* are moving the other way. After a period of medical practice being almost completely dominated by specialists, many medical schools are now actively trying to get more of their students to "specialize in generalizing."

I suspect that move is the result of their learning a lesson that sooner or later will suggest itself forcibly to *any* field that tries to make narrow specialization a way of life. On the whole, I think Lazarus Long* was right: "Specialization is for insects." ■

*In Robert A. Heinlein's *Time Enough for Love.*

We welcome your letters, which should be sent to *Analog*, 1540 Broadway, New York, NY 10036. (CompuServe: 71154,662. Internet: 71154.662@compuserve.com.) Space and time make it impossible to print or answer all letters, but please include your mailing address even if you use e-mail. If you don't want your address printed, put it only in the heading of your letter; if you do want it printed, please put your address under your signature. We reserve the right to shorten and copy-edit letters.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# ON COMPUSERVE, YOU NEVER KNOW WHO'LL BE DROPPING IN.

Because on CompuServe, you can communicate with other intelligent life-forms from around the block or around the planet. Our Science Fiction Forum lets you connect with science fiction writers, editors, and other aficionados. You can download files on everything from cyberspace to outer space. Or get the latest news, bios, and other interesting information from ***Analog*** and ***Asimov's Science Fiction Magazine*** in our new Asimov/Analog Section.

To order CompuServe, call 1 800 524-3388, representative 653. We'll give you a free $15 usage credit to get you started. From there, who knows who you'll end up talking to?

**CompuServe**

The information service you won't outgrow.

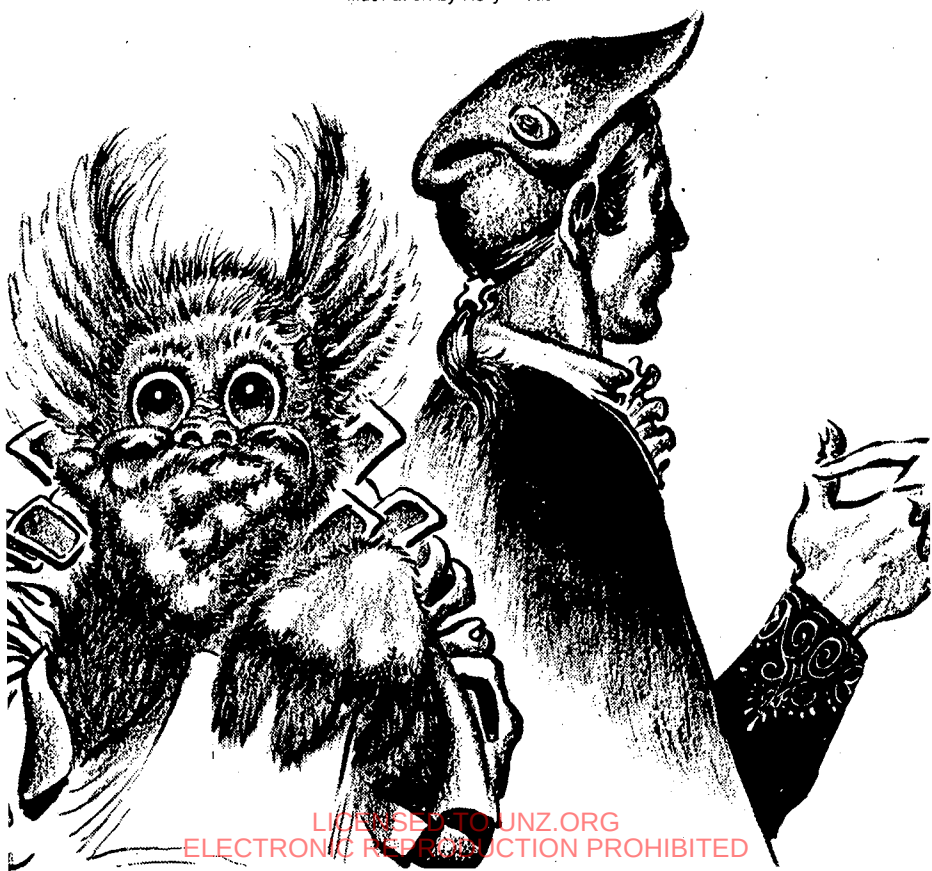
LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

W. R. Thompson

# TOUCHDOWN, TOUCHDOWN, RAH, RAH, RAH!

*"When in Rome" was a good deal easier in Rome than on Kya!*

*Illustration by Kelly Freas*



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"A human player," Zelk said. The dean of Vrekle University sniffed thoughtfully as she read the papers Ray Bennett had put on her desk. Ray thought she looked puzzled; her dark muzzle had grown more wrinkled than before. "Coming to Kya, this student's main desire is to play bagdrag?"

"It's not his only reason for coming here," Ray told her. "Richard Faber is majoring in education. He wants to extend his studies to include some nonhuman educational techniques."

"Yes, his letter mentions that." The dean stood up and walked over to her office window. It was late summer on this part of Kya, and a warm breeze brought a scent like cinnamon through the glassless window. Ray enjoyed it, although he knew it had a greater impact on Dean Zelk; the kya had an exquisite sense of smell. "Representing him, what can you tell me about him?" she asked, as she idly stroked at the thick fur on one forearm.

"He's just finished his second year at Colorado State," Ray said. "His scholastic record is good. He's a star football player. I guess he wants to branch out into new sports."

" 'Vutebowl'?" The dean shrugged her furry shoulders at the alien word. "Hearing this, I take it you don't know him personally?"

"That's correct," Ray said. He squirmed a bit on his stool. The kya were basically humanoid, but there were enough differences in their anatomy to make their furniture awkward for humans. "I'm a business agent. Faber and some other humans contacted me through my office on Earth, and asked me to help him enroll in a good Kya university." He decided not to mention that the "office" was a post-office box in New Jersey. He wanted to give the impression that he was a successful businessman, not a misplaced linguist who had blundered into a new profession.

Zelk's floppy ears twitched in interest. "Would these other humans be his family?"

Ray shook his head. "No, they're the Galactic Sports Network. GSN is offering to pay all of Faber's expenses, on two conditions. One is that he plays on your bagdrag team. The second is that the network gets to purchase the off-world broadcast rights to your team's games this year. They're offering a very generous payment for those rights," Ray added. Generous, indeed, he thought. His mouth had watered when he had heard GSN's offer; his 10 percent of the deal would make him well-to-do, if not wealthy.

"I get the scent," Zelk said. Technologically, Kya was a century or so behind Earth, with machines and industries similar to those of the 1930s. In other areas the kya were as sophisticated as humans—and the scent Zelk had was money for her institution. "Exactly what terms do you have in mind?"

The phone woke Ray the next morning. "Glargh," Ray said. "Hroo'izhit?"

"Mr. Bennett?" a doubtful kya voice asked. "Zgorch Aerodrome calling."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Ghuh?" Ray sat up, tried to work the gummy taste out of his mouth, and looked at the phone. There was no image over the plate, which meant the caller was using a local voice-only phone. "What's the problem?" Ray asked in Wideplain, the local kya language.

"The *Stanley Weinbaum* is landing in a few hours," the caller said. "Being so, you're scheduled to meet a passenger, a—" paper rustled "—a Reek Hard Vapor?"

"You mean Richard Faber?" Ray asked. He shook his head. "Impossible. He isn't due for another, uh, forty or so days."

Somehow the caller made Ray picture a shrug. "Having just received the *Weinbaum*'s passenger manifest. I can tell you he's on board. His shuttle lands in an hour."

"I see," Ray said. "Thanks for calling. I'll be down in a while."

Ray bathed and dressed. He had signed the contract with Zelk last night, then called the network to let them know they had a deal. The Earth-Kya trip took six weeks—well, the network must have assumed that Ray would successfully complete his negotiations, and set things in motion months ago. That was a dangerous assumption, he reminded himself. The kya might have turned down the deal; offers that seemed good to humans sometimes struck them as atrociously unfair. In a dozen years of interstellar exploration humanity had met no other alien races beyond the kya, and in consequence humans had little practice in dealing with outworlders.

Ray took an alcohol-fueled cab to the Zgorch airport. The airport was a busy place, with winged, propeller-driven vehicles buzzing over and along its concrete runways and hangars. As the cab dropped him off at the terminal he saw signs of human presence at the airport. The control tower had been fitted out with microwave radar and navigational aids, and one of the aircraft on the main taxiway sported repulsors instead of wings and props. Inside the terminal, scores of furry kya moved through the lobby while hidden loudspeakers oozed anesthetically-soft music into the air. The kya, Ray thought, were never going to forgive humanity for teaching them about Muzak.

"Mr. Bennett?" a woman said from behind him.

Ray turned around and saw the scrawniest human he had ever met. At least she had a full head of dark brown hair; the current Mohican style would have intensified her skeletal look. He guessed she was anorexic. "Elizabeth Sheffield," she said, greeting him with a kya-style bow. "I'm from the HSA at Vrekle U."

"The HSA?" he asked, returning the bow.

"The Human Students Association," Elizabeth said. "We like to meet new students as soon as they land. It helps to avoid problems with newcomers."

"You're a student?" Ray asked her.

"A teacher and a student," she said. "I teach a class in human history, and I'm taking classes in kya history—I'm working on a doctoral degree in comparative history. Do you know where the cafeteria is?" she added.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Down that way," Ray said, pointing across the lobby. "Why?"

"I didn't have the time for breakfast." Elizabeth checked her watch. "The shuttle isn't due for a half-hour, so—"

"You can't eat here," Ray said. He had skipped breakfast as well, a necessity he now regretted. "The cafeteria doesn't have human-type food."

"I brought my pills." Elizabeth patted her vest pocket, then gave Ray a puzzled look. "Enzyme pills, and you don't know what I'm talking about, do you?"

"No, I don't," Ray admitted, as they walked towards the airport cafeteria. "You mean they've found a way for us to eat local food without poisoning ourselves?"

"Yes," Elizabeth said. "It was a UN project. The enzymes break down Kya proteins and carbohydrates into substances our bodies can use, and neutralize whatever doesn't fit our metabolisms. It costs less than importing our meals from Earth."

"That's probably why the UN didn't tell me," Ray said in irritation. His grocery bill ate up a respectable chunk of his income. "I'm not exactly in good odor at the embassy."

"They can be petty," Elizabeth said. They entered the cafeteria, where a young kya worked behind a long buffet table. "The stripleaf salad smells great," Elizabeth told her, switching to Wideplain.

"It's fresh from Sglunk Valley," the server said, taking a deep, happy sniff. "You don't get that sweet scent anywhere else! Double serving?"

Elizabeth nodded. "We'll have some tangleberry juice, too, please."

"Separate plates and glasses, please," Ray added. The kya carried communal living too far for his tastes.

The dining area was a simple open floor; the kya had evolved from grazing herd animals, and they liked to move around as they ate. The cafeteria had no other customers at the moment, and the two humans dined alone, balancing trays while they ate. Elizabeth gave Ray a large pill, and he eyed it dourly while she washed down her own pill with some murky green juice. "There's nothing to worry about," Elizabeth told him. "I've been using these pills for the past six months, and they haven't failed me yet."

"It's just going to take some getting used to;" Ray said. He took the pill with some juice, which tasted better than he had expected. "Before I came here they drilled it into me that you could kill yourself eating the local food."

"You'll get used to it," Elizabeth said, taking a forkful of salad. "What can you tell me about Faber? I hear he's an athlete, and he wants to play bagdrag. Is that true?"

Ray nodded. "He was a big-name football player back in Colorado."

"Good," she said. "Putting a good human athlete on the team will impress the kya. What's his scholastic background?"

"He's got a 2.6 average," Ray said. Her face fell at that. "Is something wrong?"

"Yes," Elizabeth said. "You need a pretty high average to join the bagdrag team; playing is a reward for

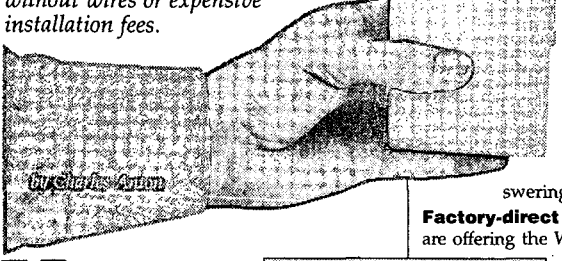


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

TECHNOLOGY UPDATE

# New device turns any electrical outlet into a phone jack

*Engineering breakthrough gives you unlimited phone extensions without wires or expensive installation fees.*



You don't have to have a teenager to appreciate having extra phone jacks; we all wish we had more jacks in the house. Would you believe adding extra phone jacks in your home could cost up to $158?

Now, a breakthrough device lets you add phone jacks anywhere you have an outlet. Without the hassle, expense, and best of all, without wires.

**As simple as plugging in an appliance.** The Wireless Phone Jack converts telephone signals to FM signals and broadcasts them over your home's electrical wiring. Just plug the transmitter into a jack and an outlet. Insert a receiver into an outlet anywhere in your home and move your phone to areas that have never had jacks before!

**Clear reception anywhere.** With the Wireless Phone Jack, your range extends as far as you have outlets: five feet or 500 feet. Its advanced companding noise reduction features guarantee crystal-clear reception, even in large homes.

You can use the Wireless Phone Jack in any outlet in or around your home, even if it's on a different circuit than the transmitter. Each Wireless Phone Jack uses one of 65,000 different security codes: no other receiver will be able to pick up transmissions from your transmitter.

**Unlimited extensions, no charge.** Ordinary phone lines can usually only handle up to five extensions. But one Wireless Phone Jack transmitter will operate as many receivers as you want. Six, ten, there's no limit. Plus, you will never get a monthly charge for the extra receivers. This breakthrough technology will fulfill all your single-line phone needs. Its digital interface even works with your fax machine, modem and answering machine!

**Factory-direct offer.** For a limited time, we are offering the Wireless Phone Jack at factory-direct prices. Plus, any Wireless Phone Jack purchase qualifies you for a special discount on a 30-minute long distance phone card—a $30 value.

**Try it risk-free.** The Wireless Phone Jack is backed by our exclusive 30-day risk-free home trial. If you're not satisfied, return for a full "No Questions Asked" refund. It's also backed by a one-year manufacturer's limited warranty.

***Added convenience anyone could appreciate...***

- **Few jacks.** *You want more extensions without the expense of calling the phone company.*
- **Bad location.** *You don't have jacks where you need them most, like in the garage or home office.*
- **Renting.** *You want to add extensions, but don't want to pay each time you move.*
- **Other phone devices.** *You want to move your answering machine, modem or fax machine to a more convenient place.*

*Wireless Phone Jack transmitter (right) and receiver (left).*

**Wireless Phone Jack products:**

**Transmitter** . . . . . **$49** $4 S&H
**Receiver** . . . . . **$49** $4 S&H
***Additional receivers*** . . . . ***$39***

**30-minute phone card. . . ~~$30~~**
***Just $9.95 with any purchase!***

*Please mention promotional code* 017AS1535.

**For fastest service, call toll-free 24 hours day**

## 800-992-2966

*To order by mail, send check or money order for the total amount including S&H (VA residents add 4.5% sales tax). To charge it to your credit card, enclose account number and exp. date.*

**COMTRAD INDUSTRIES**
**2820 Waterford Lake Dr., Suite 106 Midlothian, VA 23113**

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

scholastic excellence, like getting on the dean's list back home. We may have to tutor him. What's his major?"

"Education. I was told he wants to study kya classroom techniques, compare them to ours, and see if he can mix them into something better."

Her frown had turned into a scowl. "That's a project for a doctoral student, not somebody with a C-plus average."

"It is?" A 2.6 average had sounded great to Ray; there had been times during his college career when he would have killed for grades that good. He looked at his salad, then worked up the nerve to take a forkful of the chopped-up green leaves. He decided it tasted like lawn clippings. "I guess I'm not that hungry," he said.

"Stir it up," Elizabeth said. "The dressing always runs to the bottom of the bowl."

Ray did that, and found that the watery dressing helped the taste. "You really like this, don't you?" he asked as she demolished her salad. She had an impressive appetite.

" 'Sd'licious," she said around a mouthful of salad. "Anyway. What does the UN embassy have against you?"

Talking gave Ray an excuse not to eat. "I'm a linguist," he said. "I came here a year ago to translate a sci-fi book for a kya writer. Aside from the fact that everyone at the embassy hated the book, they don't like the idea of the kya doing business independent of them. The UN wants to control everything that comes in here—money, ideas, equipment, people."

"I know about their policies," Elizabeth said in obvious annoyance. "I've taken some heat from them over my history class. They're afraid I'll give the kya an inferiority complex, because our technology is ahead of theirs."

"Do you?" Ray asked. "Give them an inferiority complex?"

"I don't think so," Elizabeth said. "The kya don't seem to be capable of feeling inferior; their sense of herd-identity gives them a degree of security." She took some more salad. "How about you? I take it you're more than a linguist now?"

"I've been working as a business and literary agent," Ray told her. "Right now my only clients are a few kya writers, and there's not much of a market for kya literature back home. I've been trying to network with some kya business folk, but so far I haven't had much luck. Anyway, you mentioned avoiding problems. Do you have any trouble at Vrekle?"

"Nothing serious," Elizabeth said. "There are a few students who don't like having us there. Usually they're just reacting to something we've done wrong, so the trick is making sure newcomers know how to act." The loudspeaker on the dining room wall went *skreewonk,* then gabbled incomprehensibly. "That's Faber's flight," Elizabeth said dubiously. "At least, I *think* they said something about a spaceship."

"It's about time for his shuttle to land," Ray agreed, while wondering if it was a universal constant that airport announcements had to be unintelligible. "Let's go."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

They went outside. The morning air above Zgorch Aerodrome was clear and calm, and as Ray scanned the sky he saw a silver gleam appear high in the west. It grew rapidly as it came in. At the last moment it slowed and made a dignified landing on the concrete taxiway, a silver gumdrop resting on four legs.

Ray and Elizabeth walked up to it as the landing ramp unfolded. A score of humans and kya walked out of the lander. One of them was a tall, massive blond man, and even without the information Ray had received from his clients he could guess that this was Faber. "Richard Faber?" Ray asked as he approached him.

"Uh-huh. Who're you?"

"Ray Bennett. I'm working for—"

"Oh, yeah." He looked down at the ground, then hopped a few inches into the air. "Hey. They said the gravity was low here. It feels just like home."

"Kya's gravity is 91 percent of Earth-normal," Elizabeth said.

Faber looked irritated. "What's that mean?"

"It means you weigh about nine-tenths of what you weigh back home," she said.

"What's that mean?" Faber repeated.

Elizabeth sighed. "It means you weigh almost as much as you did on Earth."

"Oh," Faber said in disappointment. "I thought you could jump a mile here, like on the Moon."

"I'm afraid not," Ray said. He exchanged an apprehensive look with Elizabeth. If Faber wasn't a lot brighter than he seemed, there was going to be trouble.

The UN embassy was a large building in a respectable part of the city. The morning after Faber's arrival Ray took a bus to it from his rented home and entered the lobby, where the receptionist—a lean young woman named Delores, who wore her red hair in a narrow Mohican crest—tried to ignore him as he stood in front of her desk. "I'm here to see—"

"Ambassador Nyquist is busy," Delores said, without looking up from her computer pad. "Make an appointment."

"—About getting some enzyme pills," Ray finished.

The woman looked up. "What about them?"

Ray sighed. "According to article twelve, paragraph fifty-three of the Interstellar Operating Code of the UN Diplomatic Service, you are required—"

"—To assist all UN citizens on non-human planets." Visibly irked, the redhead tapped something into her pad. "So you can read. I'm impressed. Here." A sheet of paper extruded itself from her desk's printer. She handed it to Ray.

"An application?" Ray asked, peering at the fine print.

"We can't just *give* the pills away," Delores said. "Fill that out and the pharmacy will put you on its list."

"OK." Ray found a chair and sat down. Filling out the form was an awkward task. Although he had excellent penmanship, the form came with dozens of tiny spaces that seemed



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

meant for a Lilliputian hand and pen.

Ray had almost finished the task when Ambassador Nyquist emerged from his office. "Mister Bennett," he said. "It's been a while."

"About a year," Ray said. The last time Ray had seen the ambassador, Nyquist had been doing his best to force Ray out of business and off Kya. To judge by the gleam in Nyquist's eye, his attitude towards Ray hadn't changed. "Is there a problem?"

"No, no, not at all," Nyquist said. "I heard you were here, and I just wondered if you were having a problem?" Ray thought he sounded hopeful.

"No, no, not at all," Ray said. He gestured with the form. "I'm here to apply for some enzyme pills."

"You are? Well, I'm not sure how long it will take to fulfill your requisition, but we'll do our best to expedite the matter. By the way, how is your business?"

"I'm hanging on," Ray said.

"So I've heard." Nyquist sat down on the other side of the writing table. "Of course, you're barely making a profit, even with that deal you just signed with Vrekle University. It hardly seems worth it, especially with all the trouble you're causing."

Ray struggled to sound innocent. "I hope I'm not causing you any problems."

"Not you, personally," Nyquist said, and sighed. "But Vrekle itself—their dean has been in contact with several people on Earth. She wants to purchase a rather large assortment of scientific and cybernetic equipment."

"Is that illegal?" Ray asked.

Nyquist grimaced. "Unfortunately, no. Some rather greedy American corporations have made it impossible for the UN to restrict dangerous exports to Kya. They're more interested in profits than in avoiding damage to the development of kya society."

"I don't see where giving them computers and lab gear will hurt them," Ray said. "*We* did all right."

"We made our own discoveries," Nyquist countered. "By injecting advanced science and technology into kya society, we could rob them of the need to discover things on their own. They could become parasitical on humanity, atrophying into a world which depends on us to fulfill their needs. You should reconsider what you're doing to them."

Ray didn't respond to that. It was plausible, he admitted—and if he argued, Nyquist might delay his requisition. "I'll think about that," he said.

Nyquist took the requisition. "You do that."

Bagdrag received its name, Ray had learned, because the center of the game was a bag of sand which weighed almost two hundred pounds. The game was played by three teams on a hexagonal field. Three of the sides were home goals, and a team scored one point every time it carried the bag across its scoring line at the field's edge. The other three sides of the hexagon were shared goals, and two teams could win two points apiece by cooperating to carry the bag across the line between their home goals. When it came to competition, Ray thought, the kya just didn't get it.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

*From our "GREAT MYSTERY" audio cassette series...*

# BUCKETS OF BLOOD

**IN YOUR EAR!™**

**8 Ghoulish All-Star Tales**

starring

**Peter Lorre**

4 full hours of audible

**TERROR**

on audio cassette!
Just as originally broadcast in 1947!

Terror-filled tales include: *The Marvelous Barastro, The Lodger, The Horla, Beyond Good and Evil, The Mask of Medusa, The Queen of Spades, The Black Cat* and *Crime and Punishment* in an attractive wooden gift crate!

RADIO YESTERYEAR®
Box C, Sandy Hook, CT 06482 or call
**1-800-243-0987**
Please make checks or money orders payable to Radio Yesteryear. Or you can **charge it** on **VISA, MasterCard, American Express, Diners Club, Carte Blanche** or **Discover.**

Credit Card Number

Signature

Expiration Date

1993 Radio Yesteryear

YES! Send me _____Buckets of Blood crates at $16.95 each. Please include $3.00 shipping and handling and applicable sales tax.

Total enclosed $_____

Name_____

Address_____

City_____

State/Zip_____

Dept. 095AN

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

A week after Faber's enrollment at Vrekle, Ray walked past the school's bagdrag field on his way to the lecture halls. The field was occupied by three teams, who were busily shoving and snorting as they hauled a weathered gray bag across the grassy field. Ray looked, but he didn't see Faber among the crouching, hairy figures loping around the field.

Ray checked his notepad. Its compass display pointed him toward one of the lecture halls, where he had been told he would find Elizabeth Sheffield. He went into the tan-colored dome, and blinked against the dim light. Finding Elizabeth might take a while, he reflected; there were at least five hundred kya in the amphitheater.

He changed that estimate at once when he heard her amplified voice. Her scarecrow figure stood on the round stage at the center of the hall, where a holographic projector displayed a two-yard tall bust of Abraham Lincoln. "Unlike the kya and your herd instinct," Elizabeth was saying in Wideplain, "we humans have something which is best described as a tribal instinct. As herd beings, you kya tend to hold one another in almost equal regard, while giving your nominal leaders a minimum of authority. When you receive an order, the average kya will stop to wonder how obedience to that order will effect everyone else.

"On the other hand, we humans tend to defer to what we call an 'authority figure.' " As Ray took a seat he heard hundreds of pencils scribble down that term. "An authority figure can be a deity, a parent, an athlete, an entertainer, a politician—basically, anyone who is powerful or famous. The average human tends to give unthinking allegiance to such a figure. Sometimes this has benefits, as it gives the leader the cooperation needed to solve otherwise intractable problems. However—" The image of Lincoln winked out, to be replaced by a projection of Adolf Hitler. "—Sometimes they are problems."

Ray listened to Elizabeth's lecture for the next hour or so. Most of it sounded vaguely familiar; he hadn't taken a history course since high school, but he had watched a lot of war movies. The lecture ended and the kya students began to leave the lecture hall. "—Going to have nightmares for a *year,"* Ray heard one say. "And I thought *we* had problems," another gronked on the way to the exit.

Ray went to the stage, where Elizabeth was discussing her lecture with a group of students. "I don't understand it, either," she told them. "Killing millions of people in a war makes no sense, not when the purpose of war is supposed to be taking control of the enemy. Sometimes it seems like a ritual display of aggression—'I can kill more people than you can, so I'm the better leader.' We'll discuss that in the next lecture."

The talk broke up and Elizabeth extracted a cartridge from the projector. "Interesting talk," Ray said.

"Thanks." She grinned at him. "Are you thinking of enrolling?"

"No, I'm scared of taking tests," Ray said. "I just came here to ask you how Faber is doing."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Elizabeth sighed. "Well, it's the start of a new semester. He'll settle down soon enough."

"Is he a problem?" Ray asked.

"Do I have a corner on the pipe-stem market?" Elizabeth rubbed her bony chin. "He's not stupid, but—well, maybe you should talk to him. Let's go to the dorm."

They walked out of the lecture hall and crossed the campus. The grounds reminded Ray of some of Earth's better colleges, with clusters of buildings placed amid expansive lawns and gardens. The main difference, he thought as he looked at one group of students, was that typical human students did not graze on the shrubbery.

Elizabeth noticed his gaze. "It cuts down on the gardening bills," she said.

"I'll bet it does," Ray said. "Speaking of food, how long does it take the embassy to deliver those enzyme pills?"

"No time at all," Elizabeth said. "Are you having trouble with them?"

Ray nodded. "They tell me that there's a two-week processing period, followed by a six-week shipping period. And it's a hundred IMUs a week."

Elizabeth's eyebrows went up. "Boy, they must really hate you. Whenever I need some pills, I go to the embassy and they give me a month's supply for ten IMUs."

"I see." Ray thought black thoughts about Nyquist as they walked to the dormitory complex. The ambassador couldn't run him off the planet, not officially, but he could do his best to inconvenience him.

The dorms were a collection of small buildings placed on a hillside at the edge of the campus. Despite their size Ray knew that each building housed a score of kya students, who lived, dined, studied and slept in a single common room. Given the human need for privacy and spacious rooms, the human dorm stood out by its size. It had been erected a few years ago, and it looked like an apartment building, complete with a swimming pool and an enclosed patio.

"We're also downwind of the other buildings," Elizabeth told Ray as they entered the lobby. It was cleaner than he had expected, and he reminded himself that the people here were carefully picked graduate students. They would have outgrown the slovenliness he recalled from his own freshman days. "Most kya don't mind our scent, but our cooking drives them up the wall."

"You mean the smell of cooking meat," Ray said. The kya were strictly herbivorous, and while they had exterminated most of their world's larger predators they still regarded meat-eating with unease. "I know. I'm renting a house in town. I had to turn vegetarian because the neighbors complained whenever I ate meat."

Elizabeth nodded. "We had trouble last term when we had a barbecue. The wind shifted and blew the smoke across campus, and five thousand kya were ready to stampede through here." She looked around the lobby and spotted a young man, who lay sprawled on a couch as he read a kya medical textbook. "Toshio, have you



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

seen Faber anywhere?"

"Yeah." The student waved a hand toward the stairs. "Reek Hard is hitting up on Grace," he said.

" 'Reek Hard'?" Ray asked quietly, as he followed Elizabeth up the stairs. He'd heard the kya mispronounce Faber's name that way. It didn't sound good if humans had picked up that variation.

"Faber *likes* that nickname," Elizabeth said. "He thinks athletes need a mean-sounding name."

"Oh."

Ray saw Faber as they reached the top of the stairs. He was leaning against a doorjamb as he spoke to a short, dainty-looking black woman with an unruly Mohican haircut. She looked far from happy with Faber's attention, although he seemed blissfully unaware of that. "Richard," Elizabeth said, "Ray wants to see you."

"Can it wait?" Faber asked. "Me and Grace are planning what we're doin' tonight."

"I'm studying," Grace said firmly. "Don't let me keep you from your visitor." She scurried away from Faber with the speed and agility of an Olympic gymnast.

Faber looked irked as she vanished. "These poindexters are weird," he said. "All they do is study. Hey, I wanted to ask you about that. Studying, I mean. They told me I have to take a bunch of classes?"

"That's right," Ray said.

"What for?" he asked. "C'mere." He led Ray and Elizabeth into his room. The walls were decorated with football posters and pin-ups; Ray decided that Faber had two interests in life. "Look it this crap," Faber said, picking up a textbook. "They got me studying *algebra.* What moron saddled me with that?"

"I did," Elizabeth said. "It's the simplest math course—"

"I know you did it," Faber said, chucking the book onto his bed. "But who needs math? I mean, if you really care what $x$-squared equals, why not ask an AI? That's why we invented them. And why study poetry where the words don't even rhyme, or this old language called Longvalley that they don't even speak any more?"

"The purpose of education is to expand your mind," Elizabeth said. "Maybe you'll never need algebra or Longvalley in your life, but you *will* need your mind."

"I like my mind the way it is," Faber said. "And all this studying is cutting into my practice. I never had to study like this in Colorado."

"This isn't Colorado," Ray said. "The rule here is that playing bagdrag is a reward for good grades."

Faber grunted in disgust. "How can you get together a good team that way? Don't these people know anything?"

Count to ten, Ray told himself, as in your 10 percent commission. "Have you been practicing?" he asked.

"Yeah, I've been getting in an hour or two every day," Faber said. "Bagdrag is a mick, but if you and GSN want me to play good—" he jabbed a massive finger into Ray's chest, "—you'd better cut me some slack with the books."

Ray left the room with Elizabeth

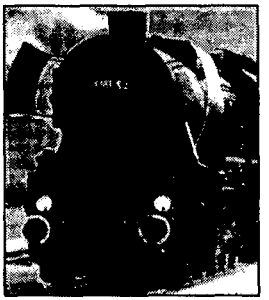


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# *Ride The ORIENT EXPRESS*

An Incredible Video Journey

# The Greatest Train Ride Ever Filmed!



Climb aboard the world's most intriguing train and enjoy the travel adventure of a lifetime. The Orient Express, now restored to its original splendor, takes you on a glorious five-day tour which sweeps across Europe and ends at the fabled city of Istanbul.

**Enjoy Marvelous Panoramas**
Magnificent mountains, rivers, the delightful Vienna Woods... Relax and enjoy a marvelous panorama as the great blue train hurtles across an ever-changing landscape. Imagine your seat mate is a famous passenger of yesteryear-King Leopold perhaps, or Toscanini or Agatha Christie. Narrated and photographed by film maker Kathleen Dusek, this unique video evokes the charm of a fascinating bygone era.

**The Ultimate In Luxury**
Now a priceless museum piece, the Orient Express makes its historic run only twice a year. What a privilege to be aboard-to experience the world-class meals, the meticulous service, and the warmth of new-found friendships. Watch as the train is prepared for journey, and as it is pulled over the mountains by antique steam engines... An unforgettable delight for train buffs.

**Great Historic Cities**
Savor the wonders of Paris, Munich, Salzurg, Vienna, Budapest, Bucharest, and exotic Istanbul. This trip follows the route of the original run in 1886. But it lasts 5 days instead of the customary 73 hours, allowing time for some brief, fascinating stop-overs. Enjoy a sumptuous champagne banquet, stroll by Dracula's castle, and much more. VHS; 60 minutes.
**Money-back guarantee.**

**You Can Experience the Legendary "Train of Kings" every day... On a 1,700 mile trip from Paris to Istanbul which runs only twice a year!**

**Abigail's Treasures,** Dept. 095 AN
Box 2957802, Myrtle Beach, SC 29578-7802

**Yes!** It sounds Great- I'd love to audition the **Orient Express** Video(s) (Item #W508) on 30-day money back guarantee.

❑ Mr. ❑ Mrs.
❑ Ms.

Name _____

Address _____

City _____

State _____ Zip _____

❑ One Video for only $19.95 plus $3.95 ship. & hdlg. Total $23.90
❑ Great Gift Ideas! Two for only $38.00 plus $4.95 ship. & hdlg. Total $42.95

Charge to my ❑ Visa ❑ MasterCard

Acct.# _____ Exp. Date _____

Enclosed is $_____ (NJ residents please add sales tax.)
Please make check/M.O. payable to Abigail's Treasures
To help process order, you may wish to include your daytime phone number.

( ) _____

Fulfillment G&C Associates — Please allow up to 4-6 weeks for delivery

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

and went downstairs. "I can see why he likes his mind as it is," Elizabeth said. "It's obviously in mint condition."

"I noticed," Ray said bleakly. "You mentioned tutoring. Would that help?"

"It might," Elizabeth said. "If we can get him to apply himself. And if we can find someone willing to work with him. Nobody here likes being around him. He thinks the boys are nerds and the girls are bimbos-in-waiting."

"I was thinking of hiring some kya tutors," Ray said.

"With his manners?"

"I guess not," Ray said.

"Maybe we can work something out," Elizabeth suggested. "Why don't we discuss it over dinner? I know a good restaurant."

The "good restaurant" turned out to be much like the airport cafeteria. The dining area was an open floor, where groups of kya wandered around with cups and small bowls. The buffet tables were larger than the one at the airport, however, with a wider selection of food, and a band that played what Ray assumed were hit tunes.

After Elizabeth gave Ray an enzyme pill she led him to one of the tables and helped him pick out a course. "We'll come back for the second course when that's done," she said as she picked up a large glass of juice. "Don't worry about sharing the bowl with me, and let me know when you're thirsty. And if someone walks up and takes a bite from our bowl, talk to him. Sharing food is one way they introduce themselves."

"OK," Ray said reluctantly. He told himself it would be similar to dining in a Japanese restaurant—not that he had ever done that. "How often do you come here?" he asked, as they moved out onto the floor.

"All the time," she said, scooping some shredded leaves from the bowl. "The food's great, there's always someone interesting here, and the band is the tops. Now try the knotvine."

Ray did so, and found that it tasted like chocolate, only better. He was about to take more when a kya shuffled up to him and plucked some shredded knotvine from his bowl. "Rabenit, isn't it?" he asked. His fur was thick and fluffy, a handsome thing by kya standards. "Talking with Dean Zelk, she told me I couldn't mistake your scent."

"Call me 'Ray,' " Ray said, and introduced Elizabeth. "Always glad to meet a friend of the dean's."

"Likewise," the kya said. "I'm Ghorf, of the Easthills Combine. Dining here all the time, I don't believe I've scented you here before."

"Elizabeth is introducing me to kya cuisine," Ray said. Then, recognizing a business opportunity when he saw one, he went on, "Is there anything I can do for you?"

"A good deal, I hope. Hold your breath if I'm being rude, but is it true you're not part of the Dirt embassy?"

Ray smiled, although he wished the kya wouldn't be so literal about translating "Earth" into their language. "It's true."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

The kya sniffed in delight. "Dining with Zelk the other night, she mentioned that I might be able to hire human agronomists through you. Being a farming organization, the Combine is always looking for ways to improve crop yields. Reading about Dirtly agriculture, I've heard you people do fantastic things with your sciences. Naturally we'll pay well."

"I'll see what I can do," Ray said. "It might be expensive, but I'm sure there are some people who would like to work here."

Ghorf sniffed in delight. "Not wishing to smell rude, I still have to say that your embassy wasn't this cooperative."

"I understand." Ray agreed to visit Ghorf's office to learn more about his needs, and then the kya wandered off among the other diners. As he left his muzzle twitched mightily—in pleasure, Ray hoped.

Elizabeth offered Ray a drink from her cup. "They like doing business over meals," she said. "Maybe that's why the embassy doesn't want to sell you any pills."

"Could be," Ray agreed. That would cut down on opportunities such as this. He had to admit that Nyquist could be a subtle man. "Thanks for bringing me here."

"My pleasure." She gestured at his bowl, which was empty. "Time for the next course."

"That'll teach me to talk while you eat," he said, following her back to the buffet. She had steadily packed away the knotvine during his conversation with Ghorf, leaving an empty bowl. "Hold your breath if I'm being rude—"

She laughed at the kya expression, "—But how can I eat so much and still be so skinny?"

"I wasn't going to put it *that* way," he said.

"Allergies," she said, as she scooped spoonfuls of small white beans into Ray's bowl. "My body stopped producing some enzymes a few years ago, which means I can't digest dairy products and most grain products. Plus my immune system freaked out on me, so I'm allergic to even more things."

"That must be why you're so underweight," Ray said. "Malnutrition, right? It doesn't do you any good to eat things if you can't digest them."

She nodded. "A lot of things are as nutritious as sawdust to me—or worse. Sawdust wouldn't start a histamine reaction, or inflame my small intestine, which keeps me from absorbing whatever nutrients I can get out of food—and as a bonus, that inflammation makes everything, uh, speed right through me. I'd eat some bread, or an egg, or have a soft drink, and be sick for days. After a while it seemed everything I ate did that to me." She looked wry. "At times I thought I'd have to eliminate food from my diet."

Ray nodded thoughtfully. It was the same problem humans had on all alien worlds; evolution had fitted Terran organisms to one specific environment, which did not include exotic biochemicals. On different worlds alien bacteria poisoned the roots of plants in unEarthly soils, insect bites touched off histamine reactions, and



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

airborne spores blighted lung membranes as they were inhaled. Compared to most worlds, Kya was a benign place for unprotected humans. "I'm surprised that you're not allergic to kya food," Ray said.

"Thank the pills," Elizabeth told him. "They digest all the nutrients, and the human immune system doesn't react to the break-down products. When I found out about that it made moving to Kya look like a good idea. Now I'm not sick all the time, I don't have to wonder if there's some allergen in what I'm eating, and I've gained twenty pounds."

"And you can eat in restaurants," Ray said.

"Exactly." She looked him over as she refilled the glass. "Not many people would think of that."

"It seems obvious," Ray said. "You can't expect a chef to be a dietitian, too."

She nodded. "I really missed going to restaurants, and calling out for a hoagie. That's one reason I like Kya; I can dine out. Plus, the kya are a blast, and trying to understand their history is fun—I'm taking four classes this semester and enjoying every minute of it."

"I heard your lecture the other day," Ray said. "You seem to enjoy teaching them, too."

She nodded vigorously. "Explaining human history to them is fun. And with the way they look at things, I'm getting some new perspectives on human history."

"I think you scared the daylights out of your class," Ray said.

"I know." She looked unhappy. "I try not to frighten them, but it isn't easy. I have to give them an idea of what we're like, and I can't make it all sugar and light."

Ray nodded; explaining the human predilection for dictators could be awkward. However—"You need a lighter approach," he said. "It might help if you told them about one of our evolutionary cousins."

"You think so?" She looked interested. "Which one? Gorillas? Baboons?"

"Lemmings."

She looked startled, then laughed.

Ray spent the next morning at Ghorf's office. The executive was only able to speak with Ray for a moment, but after he left his assistants outlined the Easthills Combine's business needs and investment resources. Ray wasn't certain just how far their money would go. While wealthy by kya standards, the Combine was handicapped by an unfavorable exchange rate. The kya had few products which were worth importing to Earth, and that made their currency almost worthless.

As Ray left Ghorf's office he realized that the kya had an untapped resource. With their sense of smell, they might have agricultural techniques unknown on Earth; they might be able to smell the differences in soil types and nutrients, or sniff out pests and diseases. He decided to consult with the agricultural experts at Vrekle University, and see if it would be worth sending a few of them to Earth to sweeten any trade agreement.

With that in mind, Ray paid Dean



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# YOUR PASSPORT TO NEW WORLDS!

## Applying is easy!

## Just call (800) 777-9901 and ask for "Far Travelers."

## No Annual Fee*
## Low 12.9% APR*

*For the first year. After the first year, the variable rate as of December 1, 1994, would be 16.65% for a High Line Card , 17.65% for a Standard Card and 21.55% for a Secured Card. The APR for cash advances would be 21.55%. The annual fee would be $40 for a High Line Card, $20 for a Standard Card and $35 for a Secured Card. The transaction fee for a cash advance is 2% of the advance with a minimum of $2 and a maximum of $10.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Zelk a visit. The possibility of making a good deal had placed him in a pleasant mood, but his cheer faded as he entered the dean's office. Nyquist stood in front of Zelk's desk with a folder of fax papers, while the dean looked unhappy. "Well, Mr. Bennett," the ambassador said. "This is an unexpected pleasure."

"I imagine it is," Ray said. "What brings you here?"

"A client of yours, one Richard Faber. As I was just telling Dean Zelk, there are irregularities in his grades. I have the facts here." Nyquist gave the folder to Zelk, who silently looked through the papers. Ray looked over her shoulder and saw an assortment of transcripts, letters and news-fax clippings. *Heisman Candidate May Face Criminal Investigation,* one headline declared. "During his sophomore year in Colorado he had a GPA of 2.6, but he didn't earn it. His higher grades were given by some complaisant instructors who wanted him to remain on his school's football team; his actual GPA was 1.1. Faber himself may not have been knowingly involved in any criminal actions in this matter, but—"

"I get the point," Ray said.

"—His hasty departure from Earth suggests that he was not as pure as the driven snow," Nyquist concluded. "Especially as his uncle bribed a few people in Immigration to turn a blind eye to the situation. Dean Zelk will have to expel him, since he was admitted under false pretenses. It's a pity that your business arrangement will collapse, especially as GSN will want its advance payment returned—I believe the contract requires that? Pity." He left.

"Sneeze on him," Zelk muttered after the door had closed. "Being the dean, *nobody* tells me how to run my school."

Ray nodded. "Is there any way you can keep Faber in school?" Returning his commission on the advance, he reflected, would bankrupt him—which was probably what Nyquist wanted. Now that it was too late, he saw that he had a lot to learn about his business.

"There *must* be a way to keep Faber in," Zelk said grimly. "Having already spent the advance, we can't afford anything else. This being a new situation, however, I'm not sure what we can do. There aren't any rules or guidelines."

"Then you can make them up as you go along," Ray said. "How long will it be until Faber earns some grades here?"

"The primary exams are in another twenty days or so," Zelk said. "I suppose we *could* judge him on their basis. But if he does badly—" She exhaled grimly. "He's out."

"He's out, we're out, everyone's out," Ray said. "I'll make sure he understands that conjugation."

Ray consulted his notepad as he left the dean's office. It told him that Faber should be in bagdrag practice now. Ray let the pad lead him to the hexagonal field, where the student players had divided into three teams and were avidly hauling the bag across the grass. Even wrapped in the helmet and quilted pads which the players used for protection, Faber's



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

bulk and erect posture stood out amid his kya teammates.

A short, chunky kya with grizzled fur and a heavily wrinkled muzzle approached Ray as he watched the practice. "Coach Znayu," he gronked. "Can I help you?"

"I'm here to see Faber," Ray said. "How is his playing?"

"The terror from beyond the ozonosphere?" The coach shook his head in what seemed like amazement. "Reek Hard's the best offensive player I've ever seen. Point him at a goal line and he's unstoppable. Just watch him."

Ray watched as the teams shoved and ran their way through several more plays. He could make nothing out of the plays and Faber's activities; sometimes the teams dropped the bag and began to push one another around, and sometimes a group of kya stampeded over the bag, pushing away the players who carried it. At other times most of the players stood around while a few of their teammates ran back and forth and talked with one another. "Who're they?" Ray asked the coach.

"The outrunners," Znayu said. "You don't know the game?"

"It's new to me," Ray admitted. "Could you give me a few pointers?"

Znayu sniffed agreeably. "Being the brains of each team, the outrunners coordinate plays among the three teams. Maybe in one play the Grass-scents will think they can do better if they work with the Tree-scents against the Flower-scents, and maybe in another play the Grasses like their chances against the other two teams in combination. During the plays they watch the other teams and tell their teammates what the opposition is doing. Then—stench! Stench!" The coach trotted onto the field and began to berate one of the teams over a technical foul.

Ray watched the outrunners as the play was repeated. He decided they looked like members of a herd, guarding the flanks to warn their compatriots against predators. They stayed out of the actual crush of the plays, although opposing players sometimes positioned themselves to block their view of the action. Maybe I *am* learning something, Ray thought.

The coach called a break and the players went to the sidelines. Ray went to where Faber was refreshing himself from a water bucket. "We have a problem," Ray said in English. "Nyquist just told Dean Zelk about your grades in Colorado."

"He did?" Faber swore. "I told Uncle Dick this wouldn't work."

" 'Uncle Dick'?"

"Richard McIlvaine. He owns the Galactic Sports Network. I'm named after him," Faber added proudly.

"Oh."

Faber nodded. "Anyway, the NCAA put the heat on the school about grades, like anyone really expects athletes to waste their time studying, and all the reporters were saying how everyone oughta go to jail, so Uncle Dick suggested I transfer before the weenies did something bad, like expel me, and he thought maybe I should come here, because I wouldn't take any heat if I got off-planet, and anyway he wanted to see



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

if there was an audience for alien sports, and putting me on a bagdrag team would maybe help make me look good back home. Or something like that."

"I see." Ray felt his head ache. "Dean Zelk told me she'll expel you if you don't get good grades in the next exams. You won't be allowed to play if you don't get good grades in the next exams. You won't be allowed to play if you don't get excellent grades."

"Uncle Dick won't let anyone push me around like that," Faber said.

"Don't count on that," Ray said. "Zelk won't let anyone push *her* around, and—"

Ray was the one who got pushed around, as Faber planted his hand on his chest and shoved. Ray sprawled on the grass as Faber stomped away from him. For a moment he was angry enough to jump up and fight Faber, but the thought of the inevitable outcome brought him to his senses.

Besides, he knew a better way to handle Faber.

Ray went to the embassy after his meeting with Faber. Delores kept him waiting for several hours before admitting Ray to the communications room. At least they can't prohibit me from making calls, Ray thought; the UN required the embassy to give all UN citizens equal access to its t-radio system. Ray made several calls to agricultural associations before he found one which seemed interested in doing business with the kya. Ray made some tentative arrangements with the company, then placed a call to Richard McIlvaine.

McIlvaine answered with a cranky noise. "Any idea what time it is?" he demanded.

"I'm sorry," Ray began, "but Earth and Kya are in different time zones."

"Kya? This about my nephew?"

"Yes," Ray said. "Your nephew is in trouble at Vrekle."

"What? Richie's a good kid. How can he be in trouble?"

"He isn't studying," Ray said, "and somebody told the dean that his grades were inflated at Colorado—"

"That's a lie," McIlvaine said. "Richie studied hard. Anyway he had nothing to do with it. The board of trustees arranged the whole thing without telling the players."

"I'm sure they did," Ray said, "but now the problem is at Vrekle. Richie won't be able to stay in school, much less play bagdrag, if he doesn't improve his grades right away."

McIlvaine growled. "We've got a contract," he said. "If that alien school sticks it to me, I'll sue."

"They're within their rights to expel your nephew," Ray said. "But I may have a way to straighten this out."

McIlvaine grunted in annoyance. "Talk."

"Your nephew doesn't like it here. He's rooming with some grad students, and there's a lack of potential girlfriends—"

"Tough," McIlvaine said. "Nobody's making him hang out with a bunch of poindexters, and if he thinks I'm going to ship him some broads, he's nuts."

"It would help if you made that



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

clear to him," Ray said. "Call him and let him know he's stuck here if he doesn't make the team."

McIlvaine grunted thoughtfully. "Might work. You're not as dumb as I thought." He broke the connection.

So far, so good, Ray thought. The next step would be to get someone to tutor Faber. Ray got up and left the radio room. Delores was waiting outside the door for him. "Are you through making trouble now?" she demanded.

"Trouble?" Ray asked. "What trouble?"

She eyed him coldly. "You don't care what impact you have on the kya, just as long as you make a profit."

"I don't think I'm hurting the kya," he said. "Has it occurred to anyone here that they aren't stupid? Maybe they know their needs better than we do."

"And maybe *we* know when something is dangerous," Delores said. Her thin, red Mohawk enhanced her angry appearance; Ray found himself thinking of a buzz saw. "Has it occurred to *you* that *we* might be looking for a way to give them modern technology *without* disrupting their society? But you can't make a profit that way, can you? Now get out of here!" She strode away from him, denying him the last word.

Dissatisfied, Ray took the bus to Vrekle University. When he got there, his notepad told him that Elizabeth was attending a class on medieval kya history. Well, he told himself, there are some things a man has to do for himself. Fight his own fights. Own up to his own mistakes. Ask decent, normal people to work with Faber. He couldn't ask Elizabeth to do the dirty work for him.

A pair of students sat in the dorm's lobby as they worked over a portable computer. One of them was Grace; the other was a young, overly-handsome man who sat next to her as though he was her boyfriend. "Jack's been helping me with my research," Grace said. "The kya have a dozen major schools of economic thought, but none of them use the same terms or measurements. Our translation program has been having fits."

"It's running now," Jack said. "And the data-reduction puts everything on the standard curves. There's even an analog to the Kondratieff cycle. I'm not sure if that's good or bad."

"What's the difference?" Ray asked.

"Well, it's bad because I was hoping to find something alien to put into my doctoral dissertation on comparative economics," Grace said. "On the other hand, finding out that kya and human economies appear to obey identical laws suggests that there are universal constants in economics."

"So economics isn't as much of a dismal science as everyone claims," Ray said. The computer displayed a set of curves that looked like a plate of schizophrenic spaghetti, and some equally tangled equations, a sight which gave him an idea. "Speaking of dismal, would you be interested in tutoring Faber in math?"

"No," Grace said. "I'm an economist. What makes you think I'm a mathematician?"

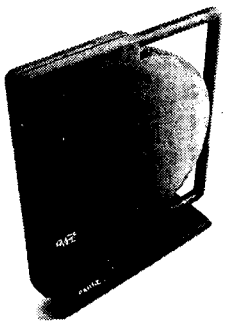
"Just a feeling," Ray said, looking at the display again.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

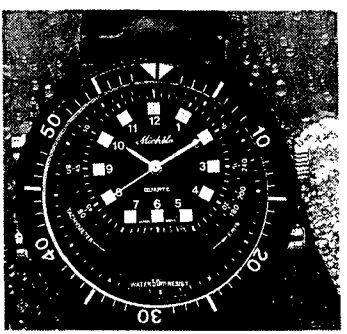
# MAIL ★ ORDER ★ MALL

## ENERGIZE YOUR RADIO WITH THE PARSEC 2000™



The Parsec Model 2000™ indoor AM/FM stereo antenna is the first compact, energized antenna that dramatically improves reception for both AM/FM radio. The Parsec 2000™ is compatible with the external antenna connections provided on most tuners and receivers. Unique dual-stage FM and single-stage AM circuitry boost signal strength to lock in stereo signals and minimize background noise. Reach more stations than you ever dreamed possible. Small (approximately 5 by ¾ by 6 inches), sleek, and attractive, this antenna fits virtually anywhere. So tune in to incredible radio reception with the Parsec 2000™. Limited 1 year warranty. UL listed. $79.98 ($6.95) #A2011.

## DIVER'S WATCH



The Diver's Watch, priced under $50, is rated waterproof to 5 atmospheres (over 150'). The movable bezel, case and band are all "black chrome" plated in a rugged matte finish. Two sunken faces provide fully independent digital analog time-keeping, so you can set one face to home time and one to travel time. Date, day and month display; alarm; 1/100 second chronograph with lap timer; choice of hourly chime, 12 or 24-hour format. Precision Japanese movement. 1-yr. warranty. $39.98 ($5.50) #A1490.

## 4-IN-1 SOCKET MULTI-PLUG

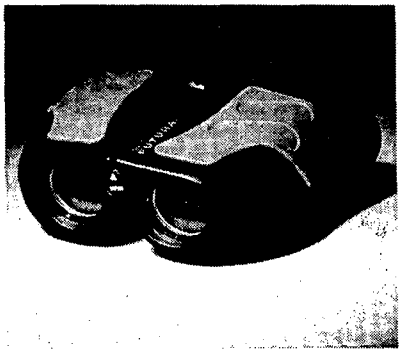
Now—have the power to run four auto accessories at one time! This versatile device lets you power up radar detectors, car phones, disc players, compressors, and other automotive appliances. Plugs into your single light socket: converts it to four. Unlike your existing socket this 4-way device has an integrated overload fuse to protect your vehicle's circuitry. $17.98 ($4.75) #2064. 2 For 29.98 (5.95) #2064-2.

**TO ORDER:** Send check with item number for total amounts, plus shipping & handling shown in ( ) payable to **MAILORDER MALL,** Dept. 095AN ; P.O. Box 3006, Lakewood, N.J. 08701, or call TOLL FREE **1-800-722-9999.** NJ residents add 6% sales tax. We honor MasterCard/Visa/Discover. Sorry, no Canadian, foreign, or C.O.D. orders. Satisfaction Guaranteed. 30 day money back guarantee for exchange or refund. Allow 30 days for delivery.

Magalog Marketing Group Inc.© 1994
1905 Swarthmore Ave., Lakewood, N.J. 08701

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# MAIL ★ ORDER ★ MALL



## BINOCULARS ACCOMMODATE EYEGLASS WEARERS TOO!

These compact (3" x 4"), lightweight (5.8 ounces) *and* strong (8x21mm magnification) Futura-LE binoculars by Tasco are designed to accommodate eyeglass and sunglass wearers. Enjoy a 367' field of view without having to remove your glasses! A focusing adjustment allows the user to set the binoculars for his/her individual viewing needs, and allows you to save this setting for future viewing. Includes pouch. $109.00 ($6.95) #A2066.

## INNOVATIVE IONIZER

A sophisticated electronic device that uses nature's way of cleaning air—emitting trillions of negatively charged ions that act like magnets, attracting microscopic particles of dust, smoke and pollen. One belongs in every room, but sometimes a table-top ionizer just isn't practical or desirable for reasons of space or your decor. This tiny unit (1 1/2"x3") provides an ingenious solution, plugging right into any wall outlet, where it will remain inconspicuous while performing its mighty task. With "on" indicator light and collector pad that can be rinsed and, eventually, replaced. By Pollenex, for fresher air in home or office. $39.98 ($4.95) #A1867. 2 for $75.98 (7.95) #A1867/2.

## ODOR & STAIN ELIMINATOR

Mother nature knows a lot about cleaning. In her realm bacteria produce enzymes that devour all manner of organic wastes. Now put this natural cleansing/purifying principle to work in your home. With the pet out system you can eliminate all the stains and lingering odors caused by animal accidents. Also works as a bathroom, laundry and general all purpose cleaner. Works on mildew and perspiration. 2 18oz. aerosol cans of OUT STAIN ELIMINATOR and 2 16oz. squeeze bottles of OUT ODOR ELIMINATOR: $24.98 ($5.75) #A1881.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Liz already asked about that," Jack said. "We'll get someone to tutor Reek Hard—on one condition."

"Name it," Ray said. "You want him to stop pestering the women? Bathe every day? Learn English?"

"Just make him pay attention," Jack said. "We'll look after the louse, but not if it's going to be a waste of time."

"And not if he's going to make us look bad by being a lazy goof," Grace added. "Make him work."

Ray smiled as he thought about his conversation with Faber's uncle. "Consider it done."

Ray returned to Vrekle a few days later to check on Faber. "Talking with Shevield, I'm told Vapor's studying harder," Dean Zelk said. "Several human students are tutoring him now. But, with a new problem arising, we may still lose out. Is it true that Vapor pushed you the other day?"

"Well, yes," Ray said. "He lost his temper, but nothing came of it." Nothing aside from an impressive bruise on the center of his chest, he thought idly.

Zelk exhaled in dismay. "Doing that, his behavior was unbecoming a Vrekle student. Having received some complaints from the student body, I may be forced to remove him from the team."

Damn Faber, Ray thought. He still didn't understand that the kya didn't regard athletes as demigods. "Maybe you can explain what happened as alien behavior," Ray suggested. "Some humans act like that when they get bad news, and I'd just told Vapor—uh, Faber, that he was in academic trouble. You could call it a ritual display of aggression."

"I scent." Zelk closed her eyes and exhaled slowly. "Maybe that will work. I'll toss it on the wind and see who inhales. Meanwhile, it would help if you were seen publicly with Vapor, to show there are no hard feelings."

"Is that important?" Ray asked. "I can't say that I like him."

"Aliens," Zelk said in resignation. "I don't know about your people, but to us, it really stinks when members of a herd are at odds. I already have enough trouble with protesters who say that humans are corrupting Vrekle. The team is going out for a trot today; you might tag along."

The things I do for my commission, Ray thought. He left the office and headed toward the human dormitory. It was fairly early in the morning, and when he entered the dorm most of the human students were getting breakfast or preparing for their classes. Ray found Faber in the kitchen, where he was packing a lunch. "Uh, hi," Faber said.

"Hello," Ray said. Faber looked and sounded subdued, which struck Ray as an improvement. "I thought I'd tag along on the team's run and see how you're doing."

"Uh, yeah, sure," Faber said. "It's only like five or six miles, or maybe kilometers, I think. We'll be back in time for class. We're leaving in a little while."

"Fine. I'll meet you outside."

Ray left the kitchen and went into the dorm's lobby. Elizabeth was on the phone, quietly gronking away in



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Wideplain. She nodded to Ray, then hung up. "That was Dean Zelk," she said. "She asked me to keep an eye on you today."

"Thanks," Ray said. Zelk obviously didn't trust Faber's temper, which struck Ray as proof of her high intelligence. "Maybe I can repay the favor. How about dinner tonight?"

"I'd love it," Elizabeth said. She glanced at the kitchen entrance. "What happened to Faber? He went to the embassy the other day and talked to Earth. I don't know what was said, but it put the fear of God into him."

"It's more like the fear of celibacy," Ray said, and described his conversation with McIlvaine. "He's really studying?" he added.

"Not only that, he got a perfect score on the dummy quiz Alexei gave him last night," Elizabeth said. "We'll make a student out of him yet. Give me a minute to change." She went upstairs.

A short while later Ray, Elizabeth and Faber were trotting away from the campus with the rest of the bagdrag team, following the chunky coach into the grassy hills east of the campus. The team had brought along a large bag, which the players took turns carrying. "Lunch," Elizabeth puffed as she trotted between Ray and Faber. "This is how prehistoric kya herds took food across wastelands. Used reed baskets and hollowed-out tree trunks. Surrounded the carriers with guards. Had to protect the goodies from other herds."

Which is where bagdrag comes from, Ray guessed. He said nothing. He wasn't in top shape, and he didn't want to waste any breath on speech. At least Faber didn't have a problem; he was barely working up a sweat. The team stopped for a break after traveling five miles or so. The coach picked a rest site under a clump of trees, and Ray sat down, pulled off his shoes and checked his feet for blisters. Elizabeth sat down next to him, gave him a pill and handed him a bottle of juice from the bag. "How are your feet?"

"A bit sore, but OK. How are you doing?"

"Not too bad." Like Ray, she was sweaty and out of breath. "We'll rest for a half-hour before we head back."

"Good." Ray swallowed the pill with the juice. Whatever it was, the drink revived him. He went to the bag, where the various players were picking out clumps of fruits and vegetables. Ray took a large cluster of orange leaves and brought it back to Elizabeth. "Better not to eat too much," she said, taking a leaf. "It's a long way back."

Ray nodded, and was about to say something when Faber sat down with them. He gave the leaves a disdainful look. "Rabbit food," he sneered, opening the lunch he'd packed. "You need *real* food if you're going to work out."

"We're doing all right," Elizabeth said.

"Aw, come on," Faber said, giving her the eye. "You wouldn't be so scrawny if you started eating some decent meals. You might even be cute with a little meat on your bones. Here."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"No, thanks." Elizabeth pulled back as he held out a chicken sandwich. "I'm Catholic. I won't touch bread."

The comment sailed over Faber's head, as did her obvious dislike for him. "There's some knotvine in the bag," Ray said, to give her an excuse to get away from Faber. "Let's get some before it all disappears."

Elizabeth got up and accompanied him to the lunch bag. "Thanks," she muttered.

"Any time. Doesn't he know about your allergies?"

"He read somewhere that there's no such thing as an allergy, so he thinks it's all psychosomatic." She sighed, and switched from Wideplain to English. "The idiot. I thought I was at the bottom of his wish list. At least, Mr. Desperate hasn't made any moves on me until now."

"That was his idea of making a move?" Ray asked. "I can make better moves than that."

She raised an eyebrow. "Do tell."

Ray hesitated. He hadn't been serious. On the other hand, he mused, he'd had worse ideas. "You'll see," he said.

They come to the lunch bag. Ray squeezed in amid the kya who were picking out food, found some knotvine and took a handful. As he walked away he overheard Faber talking with some of the players. "Right now I'd kill for a charbroiled steak," he said.

Faber's companions snuffled with nervous laughter. "I thought you had to kill anyway, to get a *styake,*" one said.

"We don't kill anything for meat," Faber said. "Just cattle. Jeeze, you people talk like we were cannibals."

The kya sniffed in bafflement. " 'Cannibals'?" one repeated.

Ray went back to Elizabeth, sat down and shared the knotvine with her. By the time it was gone the team coach was smacking his hands together over his head. "All right, people, break's over, let's move!"

While some of the players closed up the lunch bag, Ray put his shoes back on. He was sealing the flaps around his ankles when he heard a long, loud groan. Looking up, he saw Faber drop to his knees as he clutched at his belly. His face had gone dead white. "What's wrong?" Ray asked, going over to him.

"Dunno," he grumbled in English. "Got a knot in my guts. Feel like I'm going to boot one, too."

Elizabeth and several of the kya joined him. "What did you eat?" she asked.

"My stuff . . . some of that chocolate stuff, too."

"Did you take an enzyme pill?" she asked.

"What for?" he gasped. "Just had a little."

"We'd better get him to the embassy's doctor," Elizabeth said, as Faber lay down on the grass. She looked alarmed. "He's poisoned himself."

"How do we get him there?" Ray asked. The nearest vehicle was miles away, and Faber had to weigh close to two hundred pounds. "He's in no shape to walk."

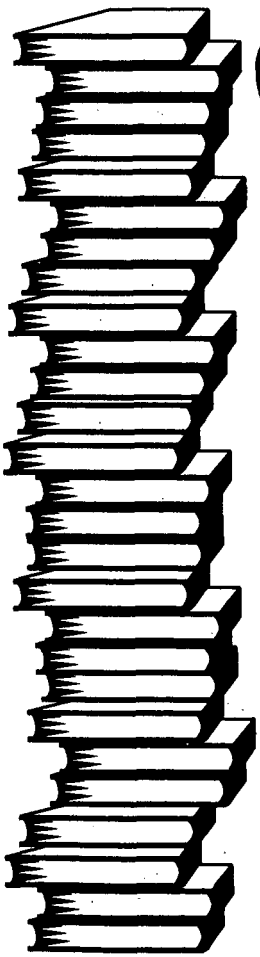
"So we carry him," one of the kya said. "We're a bagdrag team, remember?"

"This smells more like mountain-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# Anthology Sale!



Reward yourself with hours of enjoyment with our nine science fiction anthologies. Taken from Asimov's Science Fiction and Analog Science Fiction & Fact magazines, these classic stories will have you entering new dimensions.

Send check or money order for $20.95 to:

**Dell Magazines**
**P.O. Box 40**
**Vernon, NJ 07462**

Be sure to include your name and address.

Please allow 6–8 weeks for delivery. For shipping and handling outside U.S.: Canadian orders add $4.00, Foreign orders add $6.00.

MWAA0

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

drag," another kya said, eyeing Faber as he rolled on the grass.

"Let's go," the coach said. "Herd one, take Reek Hard, herd two, get the lunch bag."

"Hold it," Elizabeth said, as eight kya grasped Faber by the arms, legs and belt. "You should carry him face-down. That way, if he throws up the vomit won't drain into his lungs."

"You heard her," the coach said. The players rolled Faber onto his belly and lifted him again. He hung between the two groups of players like a lumpy, uncouth bag. "Let's move it, people," the coach called.

The team took off toward Vrekle. Ray and Elizabeth kept up alongside the group who carried Faber, who looked unconscious. "How bad is it?" Ray asked her.

"I don't know," she said. "He could go into shock or have convulsions. I wish we had an emetic; emptying his stomach would probably help."

"We could stick a finger down his throat," Ray suggested. "That would—"

"Aw, *sneeze!*" one of the kya toting Faber said.

"Did he throw up?" Ray asked.

"No, he went off at the other end." The kya's muzzle contorted in disgust.

"That's a typical food allergy symptom," Elizabeth said. "At least it's getting the knotvine out of his system."

"Oh." The kya trotted on in stoic silence.

After a while the coach called for a change in the carriers. Seeing how the kya were suffering from the smell, Ray moved in and took hold of Faber's belt, relieving one of the players of the unpleasant job. This will make Zelk happy, he thought as he jogged along. She had wanted him to make a public display of friendship with Faber. To judge by the way the kya looked at him as he helped carry Faber, they thought Ray was making the ultimate sacrifice for him.

"He'll be all right," Elizabeth told Ray that night, as they met outside the restaurant. "He started to dehydrate from the diarrhea, but the doctor pumped in the fluids and gave him epinephrine for the histamine reaction. He'll be up and around in a few days."

"Good," Ray said. "I hope he's going to be more careful. If Faber gets sick again and can't play, we're all in a lot of trouble."

"It won't happen again," Elizabeth said. "That isn't the sort of mistake you make twice."

"I hope," Ray said as they entered the restaurant. It was the same restaurant he and Elizabeth had visited before, and the buffet was well-stocked. Despite Faber's misadventure Ray felt no qualms about dining; he realized he trusted the enzyme pills. They took their food and circulated among the other diners on the main floor. "Do the kya dance?" Ray asked, as the band struck up a new tune.

"No, they're not built for it," Elizabeth said.

"You are," Ray said.

She looked wry. " 'Built' is the last thing I'd call myself."

"Oh?" He heard the self-deprecation in her tone. He didn't care for



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

that, especially not in someone he liked. " 'And yet, by Heaven, I think my love as rare, as any she belied with false compare.' "

"Huh?"

"That's Shakespeare's way of saying not to sell yourself short. I forget the rest of the sonnet," he added.

"A sonnet?" She looked surprised, and pleased. "You were right. You *do* have some good moves."

Ray was about to elaborate on that point when Ghorf found them. "There's a problem," the executive said. He took a fax paper from inside his cloak and handed it to Ray. "Calling on me today, your embassy delivered this. My sister reads some human, but she couldn't brush the knots out of this fur—she says it doesn't even look like human writing."

"No, it is," Ray said. English was the *lingua franca* of human visitors to Kya, and many kya had come to assume it was the only human language. "It's Russian. That's one of our languages."

"You people have more than one language, too?" Ghorf asked. "Who'd have thought? Translating it, what does it say?"

"It's from Moskva Mnogopher-maya," Ray said. "They're an agricultural development company. They're interested in doing business with you. They're also interested in hiring some of your people on an experimental basis, to see if they can use your sense of smell in soil and plant analyses."

That clearly pleased Ghorf. "It's good to think we can teach your people something. Let's keep downwind of one another on this." Ghorf sauntered away, his muzzle twitching.

"It's a good thing you speak Russian," Elizabeth said.

Ray shrugged. "I speak seven languages. I told you I started out as a linguist. I still can't get the hang of starting my Wideplain sentences with participle phrases, though. The kya must think I sound awful."

"Having the same problem, I know how you feel," Elizabeth said. They both laughed at that, and then Elizabeth spotted somebody across the dining floor. "Is that an old girlfriend?" she asked Ray.

Ray looked and spotted Delores, who had just passed through the door with two men. "Hardly. She works at the embassy, and she doesn't like me." She was glaring at Ray with the sort of expression generally displayed by betrayed lovers. "She looks madder than usual. I wonder what I did this time?"

The answer came a moment later, when Delores and her two companions, who were built to the same general specifications as Faber, approached Ray. "Can't you take a hint, Bennett?" Delores said without preamble. Her escorts crossed their massive arms and loomed above Ray like an impending avalanche.

Ray hoped he didn't look intimidated. "What hint?" he squeaked.

"About your business practices," Delores said. She spoke in Wideplain, and she raised her voice so that all the diners could hear her. "Watching you at work, we know how you're cheating Ghorf."

"What are you talking about?"



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Ray asked.

"Dealing with him, you've got him thinking that he's going to get wealthy off some huge business deal," Delores said. "Misleading him like that, we're going to try to have you deported. Stinking as your crimes do, we don't want you fouling the air on Earth, either, but we can't let you sneeze on the UN's reputation by taking advantage of the kya."

As Delores and her escorts walked away, Ray told himself that he had to admire her grasp of kya idioms and grammar. "Can they do that to you?" Elizabeth asked him in Wideplain.

Seeing the number of kya who were staring at him, Ray strained to phrase himself as grammatically as possible. "Having done nothing wrong, they have no basis for it. Hearing all this, I think it's a mistake. Being concerned about humanity's image, it's natural that they'd react so strongly, even to a misunderstanding. Have some knotvine?"

Elizabeth seemed puzzled by his mild reaction, but she dipped her fingers into the bowl and took some of the food. The incident seemed to pass without drawing further interest from the kya—although, Ray noticed, Ghorf stayed on the other side of the dining floor for the rest of the evening.

"I thought about saying something strong," Ray said later, after they had left the restaurant. It was a warm night, and he and Elizabeth had decided to walk the two miles back to the dorm. Kya lacked a moon, but the city lights provided a mild neon glow for walking. "But I remembered how Zelk reacted to the way Faber shoved me. The kya are a herd people, and they hate the idea of a split in the herd."

"So you tried to act conciliatory?" Elizabeth wondered.

"I tried to act like a kya might," Ray said. "Like there wasn't a real problem. Word of this is going to get around, and I don't want anyone thinking I'm so alien they can't do business with me."

"That's good thinking," Elizabeth said. "But I doubt that woman made a scene just for fun. She's up to something."

"The embassy wants to put me out of business," Ray said. "The UN is afraid that I could do irreparable harm to the kya by giving them things—information, technology, whatever—before they're ready to handle it."

"Do you believe them?" Elizabeth asked.

"I don't know," Ray admitted. "It sounds reasonable, and God knows there are plenty of cases where people meant to do well and made a real mess."

"I know." She looked thoughtful. "Nobody can predict all the consequences of their actions, and if you try to do only harmless things, you'll paralyze yourself. If something *does* go wrong because of you, all you can do is try to fix it."

"I suppose so." Then, noting that it was a warm and pleasant night, and that he had promised to show Elizabeth a few moves, he decided to investigate the consequences of some more interesting actions.

* * *



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# CONNECT WITH A WHOLE NEW WORLD

**ASIMOV'S SCIENCE FICTION magazine consistently features the finest material from the most respected authors in the science fiction field.**

SHARE THE THOUGHTS AND SPECULATIONS OF ROGER ZELAZNY, ROBERT SILVERBERG, AND CONNIE WILLIS TO NAME A FEW. YOU'LL BE ENLIGHTENED AND ENTERTAINED BY NEW AND DIFFERENT POSSIBILITIES FOR OUR WORLD AND WORLDS AS YET UNEXPLORED.

## SUBSCRIBE TODAY!

**For only $30.97 receive 18 issues and save over 34% off the newsstand price or send $22.97 for 12 issues.**

TOLL FREE

**1-800-333-4108**

MAIL TO

**ASIMOV'S · PO BOX 5130**
**HARLAN, IA 51593**

MWAS8

Outside U.S. & Poss. 18 for $39.97, 12 for $27.97 (U.S. funds only, payment with order). Include GST. Please allow 6-8 weeks for delivery of first issue. We publish double issues, in April and November. Each double issue counts as two toward your subscription

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

The grades for the semester's first batch of tests were available two days after the last paper was handed in. Feeling like a condemned criminal who has only a vague hope of receiving a last-minute pardon, Ray went to Vrekle to see if three weeks of studying had had any lasting effect on Faber.

His notepad told him that Faber was in the dorm—as was Elizabeth, who should have been attending a world (kya) history class. Puzzled, Ray went to her room and tapped on the door. "Elizabeth?"

"Gargh." The door opened. She stood there in her bathrobe, looking haggard and sleepless. "Oh. Hi. 'mon in."

Ray blinked. "Are you OK?"

"Gagh." She plopped down on the bed. "I've got a case of Proxmire's Revenge that won't quit."

"What's that?"

"What it sounds like." She grimaced slightly. "I can identify some allergens by what they do to me. *This* feels like a milk allergy, except I can't figure out how it happened. I *always* keep my food away from everyone else's."

"When did it start?" Ray asked.

"Yesterday afternoon." She rubbed her eyes groggily. " 'Bout a half-hour after we said good-bye. . . ." She raised her head and peered at him. "What did you have for lunch yesterday?"

He shrugged. "Kya stuff. And some ice cream for dessert."

"And then you gave me a kiss that made the *Guinness Book of World Records,*" she said.

"You're allergic to *me?*" Ray asked, startled.

"No, to the ice cream. It only takes a little milk-sugar to set me off . . . and I *thought* you tasted awfully sweet."

"I didn't know you were that sensitive. I'm sorry."

" 'Sall right." She managed a rickety grin. "It was worth it. You're here to see Reek Hard?"

"Well, him, too," Ray said. "I wanted to find out if he passed his tests."

"Quit crossing your fingers, the creep made it—" She shook her head. "Sorry, Ray. Cramps always turn me into a bitch." She grimaced again. "Had to cancel everything today."

"That's too bad. I was looking forward to taking you out to dinner."

"I'll be OK by tonight. Milk-sugar allergy clears up pretty fast." She sat up and rubbed her temples. "How's the business?"

"Not bad. Moskva Mnogophermaya sent me another mail fax yesterday. They made a good offer, and I'm going to advise Ghorf to accept."

"Good."

He nodded. "I'll pick up a nice piece of change, which ought to tick off Nyquist. Say," he went on, "who was Proxmire?"

"Huh? Oh." Elizabeth shook her head again. "I'm not sure. I think he was the scientist who figured out that milk causes a certain type of allergy."

That sounded reasonable to Ray. "Hell of a thing to be remembered for. . . ." His voice trailed off as Elizabeth rose from the bed and lurched out of the room. Ray looked into the hall, and saw her vanish into the com-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

munal bathroom.

Faber was standing in the hallway. "Damned skinny broad," he muttered, not noticing Ray. "Been hogging the can all day." Then he saw Ray. "You're wasting your time with her, Bennett. She doesn't eat because she doesn't like sex. That's psychology."

Ray looked at him in disdain; he had thought Faber's experience with knotvine would have given him some empathy. "Aren't you supposed to be in class?"

"I'm kinda hung over," Faber said, and belched. "Got my grades yesterday. Passed everything, so I can stop wasting time in class."

"That's what you think," Ray said. "Cutting classes will get you in as much trouble as bombing a test."

Faber glared at him and said words which approximated "You're kidding me."

"That's how they do things here," Ray said. "Clean up and get to your class."

Faber kept glaring. "What are you, my guardian angel?"

"Think of me as a fallen angel," Ray suggested. When he saw that Faber had missed his meaning he went on, "Either keep working, or learn to like what you'll find in the kya version of *Playboy.*"

"Ack!" Faber retreated into his room.

Ray left the dorm and went home. He had lunch, then placed a phone call. "Easthills Combine," a kya answered over the static-scratched wires.

"This is Ray Bennett. Calling now, I have good news for Ghorf. That being so, may I speak with him?"

"One moment." After some clickings and quiet background gronkings, a new voice came on the line. "Ghorf speaking."

"Ray Bennett. Moskva Mnogophermaya just sent me a fax. They've made a very good offer. That being so, I'd like to come to your office and discuss the terms."

"No, no, you needn't trouble yourself," Ghorf said. "Working as well as you do, you can handle everything."

"As you say." As Ray hung up he wondered what was going on. Earth or Kya, it was strange for a highly-placed executive to leave the details of a big contract in somebody else's hands. He hoped it was a sign of Ghorf's trust in him . . . but now that he thought of it, he hadn't been face-to-face with Ghorf since their last encounter in the restaurant, several weeks ago. The executive seemed to be avoiding him. In light of the embassy's attempt to poison his good name, that thought gave Ray qualms.

The *Garrett P. Serviss* entered Kya orbit and sent down a passenger shuttle three days before the first game of the bagdrag season. On the evening of the landing Ray, Elizabeth, and Dean Zelk went to Zgorch Aerodrome to greet the delegation from GSN. "This being important to him, I'm surprised Vapor didn't turn out," Zelk said as the shuttle landed.

"The HSA is having a barbecue," Elizabeth said. "The wind is coming from the right direction for the first time this month, and they, uh, de-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

cided not to wait."

"Oh," Zelk said, shuddering over her memories of the last barbecue. Ray shuddered, but for a different reason. Hot dogs, hamburgers, spare ribs, T-bone steaks—he hadn't had a meal like that since coming to Kya, and his stomach was never going to forgive him for turning down the Human Students Association's dinner invitation. On the other hand, he consoled himself, Elizabeth had accompanied him to the airport because she couldn't eat anything served at the barbecue, and there was a lot to be said for her company.

The lander deployed its ramp, and humans and robots debarked. A few tourists came first, followed by replacement staffers for the UN embassy, and then—"Oh, *no,*" Ray groaned, while Zelk let out a gronk of horror and disgust. Several men and women emerged from the ship wearing coon-skin coats and toting pennants that said *Vrekle U.* For all the world they looked like time-warped football fans from the Jazz Age.

Ray hurried up the ramp to the statuesque woman at the front of the group. "You're from GSN?" he asked.

"That's right," she said, flipping open the front of her coat to reveal a GSN logo and ID badge. "Jan Jones, sportscaster. We're here to cover the Big Game."

Even through his dismay Ray heard the capital letters. "You'll have to ditch those coats," he said. *"Fast."*

"What?" Jones asked. The sportscaster was a one-time Olympic decathlete with an imposing physique, which now helped to illustrate her annoyance. "These are authentic coon-skin coats. Do you know how much GSN shelled out for them?"

"Somebody made a mistake," Ray said. "I'm Ray Bennett, the network's business agent here. Believe me, you can't wear those things here."

"Why not?" one of the men asked. "Our PR department said it was a good idea. Their research team said that Kya's a century behind us, and bagdrag's just like football, so we should dress like we were going to an old-time ball game."

"They were wrong," Ray said. He nodded toward Zelk, whose fluffy fur rustled in the breeze. "Imagine how *you* would feel if they wore something that looks like human hide."

The GSN people traded looks, then started peeling off their coats. "I hope it doesn't get cold like they said it does," Jones said. "What should we do with them?"

"Leave them in the shuttle," Ray said. He felt relieved that the network people hadn't argued. "And don't worry about it getting cold. The weather's balmy this time of year. Come on, I'll introduce you to Dean Zelk."

Ray led them down to Zelk, who stood transfixed next to Elizabeth. "They were victims of a nasty joke," Ray told the dean. "Somebody told them that the coats would look fashionable, and they trusted the clown."

"Oh, I scent," Zelk said. Her muzzle wriggled as she sniffed the air. "But that rotting stink—ugh!"

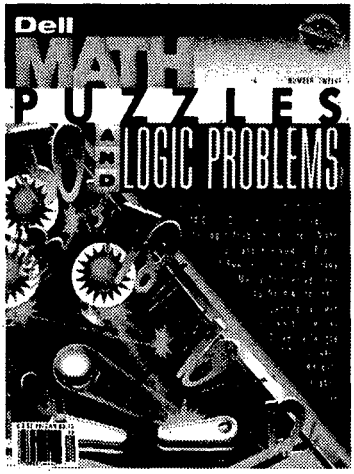
"Those coats looked like synthetic fur to me," Ray said, deftly dodging the truth. "Being made out of strong



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# OUR PROBLEMS ARE YOUR PLEASURES!

SUBSCRIBE TO




## DELL MATH PUZZLES AND LOGIC PROBLEMS AND RECEIVE 6 FUN-FILLED ISSUES FOR ONLY $17.94.

EVERY ISSUE IS PACKED WITH BRAIN TEASERS FROM FIGURE LOGIC, CROSS SUMS, WORD ARITHMETIC...TO... CRYPTIC MATH, MAZES, AND TRIGONS!

CALL TOLL FREE

**1-800-666-3606**

OR WRITE TO

**Dell Magazines • P.O. Box 5212**
**Harlan, IA 51593**

OUTSIDE U.S., ADD $3.00 PER SUBSCRIPTION.

MWPZ7


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

chemicals, I guess some synthetics could have a horrible smell to you. Uh, did the scent cling to them?"

"Yes . . . but if it's not real, I can take it." Even so her respiration sounded strained as Ray introduced the newcomers. It was as though Zelk was trying to breathe without inhaling as the people from GSN gave their names and job titles.

Elizabeth noticed that as well. "They're having a barbecue at our dorm," she told Jones. "If we hurry, we can get there before it's over. You'll probably appreciate the change from shipboard food."

Everyone agreed that that was a fine idea. Zelk offered to find transportation for them, and hurried off to the airport terminal. "Good thinking," Ray said quietly to Elizabeth. "Think we can arrange for them to spend the night at the dorm?"

"I hope so," she said. She wrinkled her nose, and Ray guessed that she was sharing his thoughts. Taking them to the dorm before they encountered other kya would give them a chance to wash off the scent of dead fur—and to learn a few things about kya attitudes and behavior.

A small bus appeared, without Zelk, and parked by the ramp. The driver got out, sniffed the air, and took Ray aside. "Talking with the lady, she told me you had a problem," she said. "Smelling this, I guess spaceship air must be really bad?"

"You could say that," Ray said, grateful for the Dean's little white lie. "When I go back to Earth, I'm walking."

The driver snuffled appreciatively at the joke. She reentered her bus and opened all the windows while the humans climbed aboard. Their roboticized luggage and equipment followed them and took up positions under the seats, and the driver took off for Vrekle University.

Zelk had clearly given the driver instructions to avoid going through the densely populated areas between the airport and the campus, which Ray saw would lessen the chance of any kya catching a whiff of the crew's unpleasant reek. The driver bore the foul odor with silent fortitude, and when she finally pulled up to the human dorm on the Vrekle campus Ray gave her a large tip. "I appreciate that," she said as the last of her passengers disembarked. She took a light sniff, and her muzzle wrinkled in distaste. "I could swear it's getting worse."

"I think you're right," Ray said. He could smell the barbecue smoke, and while that was a welcome odor, he thought he detected a second, unpleasant aroma beneath it.

Elizabeth had led the newcomers into the dorm. Now she hurried out to Ray as the bus drove off. "Trouble," she said. "Everyone's sick. It looks like food poisoning."

"Everyone?" Ray followed Elizabeth into the dorm, where he found she had been absolutely correct. Most of the students had dragged themselves back to their rooms, but a couple of them were draped over the lobby's couches. The place was a mess, Ray noted almost absently; plates of half-eaten food, dirty cups and condiments were scattered every-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

where—and the air stank with several odors he declined to identify. The network people looked thoroughly bewildered, a feeling Ray shared. "What should we do?" he asked.

"Call the embassy and get their medical people down here," Elizabeth said.

Ray found the phone and called Nyquist. Whatever his feelings about Ray, he responded at once with a promise of help. Ray hung up and went to the patio, where two of the students were lying on lounge chairs. One of them was Grace, the economist. Ray helped her walk up to her room. "Bad," she muttered as they staggered upstairs. "Never thrown up so much in my life."

"Help will be here soon," Ray said, crossing his fingers. He looked up as Elizabeth came out of a room. "How is it?"

"Bad," she said, as Grace lurched into her room. "Toshio's gone into shock. I've got him wrapped up in an electric blanket. Nick's shaking so much I'm scared he'll have convulsions. The others aren't hit as hard, but they're getting dehydrated and they can't keep anything down. They must have eaten some kya food, somehow."

"Damn," Ray muttered.

"There's more," Elizabeth said. "Faber's missing."

"Damn," Ray repeated. He could imagine Faber wandering off somewhere, then collapsing. "We can't go off looking for him," he decided. "We have to stay here."

"We can't just forget about him, either."

"I know." Ray tried to think. "Call Zelk. Have her call out Faber's teammates. They know what he smells like, and they'll have an easier time finding him than we would."

"Good idea. They can track him down like bloodhounds." She went inside to call Zelk.

The medical team arrived a half hour later, followed by Zelk and another kya. Ray stayed outside to speak with the kya while Elizabeth took the doctor and his assistant into the dorm. "Is anyone looking for Faber yet?" Ray asked.

"Coach Znayu and the team are on his trail," Zelk's companion said.

Zelk sniffed in agreement. "Bennett, this is my husband, Hraj," she said. "Being with the police, I should say Leading Investigator Hraj. Hearing about this problem, and connecting it with other things, Hraj was a bit suspicious."

"More than a bit," Hraj said. "Talking with my sweeter scent, she told me a few things that smell peculiar. Let's try to sniff out some clues."

Ray followed Hraj around, and found that he had spoken literally. He sniffed the plates and cups scattered around the lobby and patio, ignoring the unpleasant odors with the hardened sensibilities of a professional. After finding something odd in the French fries, Hraj went into the kitchen and inspected several containers of food. "These have both been contaminated with knotvine extract," Hraj said at last, pointing to a bottle of catsup and a plastic jug of vegetable oil.

" 'Knotvine extract,' " Ray said. "A



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

few weeks ago Faber ate some by mistake, while the bagdrag team was on a training run."

"Ah," Hraj said. "That could narrow our lists of suspects. Someone at the run may have mentioned it to a friend who wanted to incapacitate your people."

Zelk sniffed at the containers. "I only smell human scents on these bottles."

"Having double-checked them, I agree," her husband said. "Whoever poisoned them must have had enough sense to wear scent-proof gloves. And similar shoes; I don't smell anything but human footprints in here."

"Being so, that suggests someone with the intelligence of a college student," Zelk told Ray. "Assuming that, we'll have a smaller list of suspects."

"I understand," Ray said with a sigh. "I hope this won't cause any trouble for the university."

"Not as much trouble as I'll make for whoever did this." Her eyes narrowed to vindictive slits. "I think I can promise our network friends at least *one* genuine fur coat. . . ."

Hraj began to question Zelk about possible troublemakers among the student body. Ray went into the lobby, where he helped Jones and her team move into some of the dorm's unoccupied rooms. With that done, Ray returned to the lobby just in time to see Faber enter with one of his teammates. "Hey, Bennett," Faber said, while the kya player suddenly retreated from the dorm's stench. "Tsui tells me the whole team is out looking for me. What's up?"

"Everyone who was at the barbecue came down with food poisoning," Ray said. He felt relieved. It suddenly occurred to him that if Faber had taken ill, he would have missed the Big Game. "We were afraid you might be out dying in the bushes."

Faber looked blanker than usual. " 'Dying'? From a little knotvine?"

Ray felt uneasy. "How do you know what they had?"

"Uh, just a guess. I mean, that's what nailed me, right?"

Before Ray could answer, Hraj and Zelk stepped into the lobby. Their muzzles twitched as they caught Faber's scent. "Your scent is strong and fresh on the poisoned container," Hraj said. "Being so, can you explain why you handled it?"

"Better yet," Ray said, "Can you explain why you missed the barbecue?"

"I cut out because those poindexters don't like me," Faber said. "I didn't put nothing in any bottles."

Hraj's nostrils flared. "I said 'container,' singular. How did you know the poison was in more than one bottle?"

"Hey, it was just a gag!" Faber protested. "I was just blowing off some steam, they've had me working too hard, and anyway a few days of the trots will serve them right."

Ray started to say something cutting, then decided Faber wasn't worth it. Hraj spoke for him. "You're under arrest. Come along." Faber started to protest, a move which ended when Hraj put a hand on the pistol half-embedded in his waist fur. The investigator left with his prisoner.


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Ray stepped outside the door, where Zelk had gone to escape the heavy odors. "Faber did it," Ray said. "It was his idea of a joke."

"Ideas aren't his strong point." She exhaled in disgust. "Doing that, I'll have to expel him. And there goes the contract, and the university's finances."

"Maybe I can still work something out," Ray said. "Can you tell me what a Kya court will do to Faber? Do the victims have a say in prosecuting him?"

"Yes, of course. Why do you ask?"

"I think I can use that to salvage the contract," Ray said. "McIlvaine will cut a deal to help his nephew. I won't commit us to anything, other than a promise to try to help get Faber out of jail and off Kya—*if* he lets you keep the advance payment."

Zelk agreed to that, said good-night and left. Ray went into the lobby, where the GSN team had left its equipment. He had a hunch that they had brought along their own tachyon transmitter, to broadcast the game to Earth. His hunch proved correct, and within a few minutes he had unpacked the communications system and signaled McIlvaine's office. When the executive came on the screen he was sitting in an office, eating a sandwich. "Bad news, huh?" McIlvaine said, looking at Ray.

"Faber's in jail," Ray said. "He won't be able to play—"

"He *what?*" McIlvaine snapped. He slammed his sandwich down on his desk. "Bennett, what idiot busted him?"

"Faber poisoned almost everyone in the dorm," Ray said. "It was his idea of a joke, and—"

"I don't care what happened."

"He's been expelled, too," Ray said.

*"What?"* McIlvaine leaned over his desk and glared into the pick-up. "Bennett, I've got a fortune invested in covering these games. If we have to dump our coverage, I'll take it out of your hide!"

"You'd better listen to me," Ray said, "if you want to keep your nephew out of jail."

"Let him go," McIlvaine said. "A little hard time might make a man out of him."

"He's your relative," Ray said in surprise.

McIlvaine made a disparaging gesture. "I don't need him if he can't play. And as for *you,* Bennett, you're screwed. *You* were supposed to keep the punk in line."

Ray watched his plans sink. Then, like a shipwreck survivor, he clutched at the first idea that floated within reach. "Your basic idea was to catch an audience's interest by putting a human player on a bagdrag team," he heard himself say. "Suppose I can get another human player. Will that work? It's better than nothing."

"Not by much," McIlvaine growled. His face contorted as though he was grappling with a massive philosophical problem. "OK, it's better than letting this whole set-up go down the crapper. Get somebody. Anybody. Just make sure it's a great human player." He broke the connection.

Elizabeth came down the stairs then and sat down next to him. "Trouble?"



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"No more than usual." Ray rubbed his temples. "Faber's the jackass who poisoned everyone. He thought it was great joke. Now he's in jail and out of Vrekle."

"Damn." She started massaging his shoulders. "If he had half the brains God gave any self-respecting skunk, he'd be twice as smart as he is. What will you do now?"

"I just told McIlvaine that I'd try to get another human student to take Faber's place. He agreed to try that, so the contract lives. The question is, can we put one of the other students on the team? Will any of them recover in time?"

"No," Elizabeth said. "The doctor says they're all going to be bedridden for several days, and shaky for another week."

"Damn." Ray saw the obvious solution to his problem. "How about you?"

"Huh?"

"You're a student in good academic standing. That's supposed to be the only qualification for joining the team."

"You're crazy," Elizabeth said. "I've never played bagdrag in my life. Plus, I have about as much coordination as a Democratic presidential campaign, and if I gain ten more pounds, I'll qualify as a ninety-seven pound weakling."

"You don't need muscle to play an outrunner position," Ray said. "They don't do anything more than run around. If—"

"Not now," she said.

"All right." Ray's stomach rumbled, reminding him that he hadn't eaten lately. "Have the kya invented take-out yet, or are we going to have to cook our own dinner?"

Ray woke up on the couch, alone. Elizabeth had gone to her room alone late last night, and Ray hadn't wanted to push his luck. He hoped that suggesting that she play bagdrag hadn't done something fatal to his long-range plans with her.

A rasping noise reminded him he wasn't alone after all; the embassy's doctor had flaked out on another couch, and was still sound asleep after last night's work. The dorm was still a mess from the disrupted barbecue. Ray spent some time cleaning the lobby, and he had it in fairly decent shape when Jones came downstairs. "Where's breakfast?" she asked Ray.

"There's food in the kitchen pantry," Ray said. "Stick with the imports, unless you've got some enzyme pills."

"Uh-huh. Where's the bagdrag field? We have to get out there and set up our gear for some test shots. That, and get some shots of Faber in practice."

"Faber's been expelled," Ray said. He held up a hand before she could react to the good news. "I'm going to see if I can get another human to sub for him. McIlvaine agreed to that, so get set up in case things work out."

"Things had *better* work out," Jones said. "Covering this game is my chance to hire on with a *real* network, instead of McIlvaine's two-bit carnival. I don't want anyone to blow it for me—and waste the trip to this miserable dirtball to boot."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Things will work out," Ray promised. All he had to do was find a substitute for Faber. He toyed with the idea of enrolling in Vrekle, then realized it wouldn't work; Zelk couldn't stretch the rules far enough to pretend that he had suddenly become a student in good standing, much less an athlete. Jones shook her head as though somehow agreeing with his thoughts, and headed into the kitchen.

Elizabeth came down a moment later, looking tired and harried after last night. "Have you had breakfast yet?" she asked.

"No, I thought I'd wait until you were up. I hate eating alone."

"Same here. I'll get us something."

That seemed like an improvement over last night, and Ray was mulling it over when a kya came into the lobby. His muzzle wrinkled as the air hit him in the face, but he kept his reaction under control. "Dean Zelk wants to talk with you," he told Ray. "Nyquist being in her office, she says it's urgent."

Elizabeth popped out of the kitchen. "What's wrong?"

"I'm not sure," the kya admitted. "The ambassador being upset, I think he wants all humans off the campus."

"He can't do that," Elizabeth said. She left the dorm with Ray and the kya, who led them across the campus to the administration building. The kya ushered the humans into the dean's office, where Nyquist sat on one end of the stools Zelk kept for her guests. Ray thought the man looked pleased with himself.

Nyquist ignored Ray. "Ms. Sheffield," he said to Elizabeth. "In light of recent events, I think it would be better if the human contingent withdrew from this university."

"Why should we leave?" Elizabeth asked. "We like it here."

"You had an incident of mass poisoning last night," Nyquist said. "Luckily nobody died or suffered permanent injury, but we can't count on that luck the next time this happens."

"Vapor did it," Zelk said. "Having expelled the stinker, I can assure you there will be no repetition."

"I'm still concerned with the likelihood of trouble on this campus," Nyquist said. "You've already had protests from other students over the human presence, and this poisoning has sparked more complaints, hasn't it?"

"How would you know?" Ray asked.

Nyquist smiled smugly. "I understand the kya. From their point of view, one member of the human herd has insanely attacked the rest of his group. Isn't that so, Dean Zelk?"

"Yes," Zelk admitted. "Having received some complaints this morning—well, we can ignore them."

"Can we?" Nyquist asked. "I wish I could share your confidence, but I can't. I'm going to ask the UN to order the human students evacuated until it's safe for them to return—whenever that may be. They'll be out of here within the week, along with that network crew."

"What about our contract with GSN?" Zelk demanded. "We can't afford to have it revoked. The return of the advance money will bankrupt the university."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"That can't be helped." Nyquist stood up. "It's unfortunate that Bennett foisted such bad terms on you. Perhaps the next time you want to do business with Earth, you'll realize that you're better off working through the UN."

Zelk looked at him and exhaled loudly, a symbolic clearing of his scent from his nostrils. "She's right," Ray said. "Mr. Ambassador, you're the salt of the earth—and we all know what salt does to the earth."

Nyquist glowered at Ray. "And we know what people like you can do to Kya," he said. "You're a carpetbagger, an *exploiter*. The UN is trying to arrange an equitable, *orderly* transfer of technologic and scientific knowledge to Kya, something that won't reduce their society to chaos."

"Something that's controlled by the UN," Elizabeth said. "Something that lets *you* decide who gets to do business with the kya. You're giving yourself a lot of power, aren't you?"

"We *are* the experts in dealing with non-humans," Nyquist said. "And I suppose I should thank you people. The mess you've made will give the UN the leverage to pass legislation that lets us control *all* business conducted between Earth and Kya. We'll put a stop to fast-buck artists like Bennett."

"While you decide what we can and can't have," Zelk said. Her floppy ears swiveled back in obvious anger. "Being the wisest creatures in existence, you naturally know more about what's good for us than we do."

"No, but we have a certain amount of experience," Nyquist said, ignoring her sarcasm. "You should try to benefit from it. Good day."

Elizabeth watched him go, then turned to Zelk. "Is it too late for me to join the bagdrag team?" she asked.

Zelk let out a puzzled *gronk*. "Why do you ask?"

"Ray suggested I play in the game," she said. "If the team can field a human player, that may save the contract—and if you're going to do anything to stop Nyquist, you'll have to start with that. So is it too late for me to get on the team?"

"Never having had a situation like this before, I can't say." Zelk took a long, thoughtful sniff. "The only requirement for joining the team being good grades, you *are* qualified, so you can play."

"She's also a teacher," Ray said.

"The rules say nothing about that," Zelk said. "Calling Coach Znayu, I'll tell him to schedule extra practice sessions for today and tomorrow morning."

"I'll get over to the field now," Elizabeth said.

Ray left with her. "Thanks," he said. "I'm sorry I sprang that on you so suddenly last night."

"It's OK," she said. "But my playing in one game won't help much, not if Nyquist is going to run everyone out of town."

"At least he won't be able to bankrupt me," Ray said. "Or Vrekle. But he still wins in the end, damn it."

"Maybe not," Elizabeth suggested. "He's too clever for his own good; maybe he'll outfox himself. Just remember, it ain't over until the skinny lady sings."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

They went to the locker room, where Coach Znayu was talking to his assistants. "I know, I know," he gronked to them. "It smells like the dean's been sniffing her own breath, but she's the boss. Get the team together and we'll do what we can." He turned to the two humans and sniffed happily. "Congratulations, Shevield! Having spoken with the dean, I scent you're running with our herd. Let's get you into a uniform."

They went to a storage room, where Znayu dug into a heap of uniforms. "This is about the smallest we have," he said, handing it to Elizabeth. "We'll lace on some extra pads, so you'll have more protection." He peered at her as though looking for any sign of muscle. "The question is, can you handle your part of the bag?"

Elizabeth nodded. "Sure, no problem."

Ray realized what was being said. "You want to put her on the *bag?*" he asked in dismay. "Can't you put her in a safer position, like outrunner?"

The coach let out a snort of amusement. *"Her?* Are you kidding? It takes a year to train a good outrunner. The inner bag-carrier spots are the easiest positions to learn and play—just hold on and follow the leader."

"Until the other teams break the defensive line." Ray felt faint. "She'll get squished."

Elizabeth looked annoyed. "I love your optimism."

"I'm not kidding," he said. "Maybe you'd better back out."

"And let Vrekle down?" She shook her head. "Besides, I can't go back to Earth, unless I want to be sick all the damned time. I'd rather go down fighting."

"I see." With her allergies to Terran foods, she was better off on Kya. It was one more reason to defeat Nyquist, Ray thought. "You're sure you can handle the bag position?"

"Don't worry about me," Elizabeth said. "Worry about Nyquist. Have you got any ideas on handling him?"

"Just one," Ray said.

"Well, let's hear it."

"I want to ask if you have any ideas."

Ray was still looking for ideas that evening when he took her back to the dorm. He realized that he was the only healthy human being on the campus. The students were still sick from last night's dinner, and Elizabeth was worn out from long hours of bag-drag practice. He nearly had to carry her into her room.

"I'll be OK tomorrow," she said. She lay face-down on the bed while Ray massaged her shoulders with liniment. "The bag positions aren't too bad. I've got seven other kya helping with the weight. All I have to do is carry twenty pounds of sand and keep up with them."

"And keep from getting turned into jelly when the opposing teams charge the bag," Ray said. When one team had sole possession of the bag, the other two teams would gang together to take it away from them. The play looked like a furry tidal wave.

"That's why the uniforms have a lot of padding," she said. "Besides, Vrekle has the best defensive line in the league, so I'll be safe. 'Stick to-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

LICENSED TO UNKNOWN
ELECTRONIC REPRODUCTION PROHIBITED

gether and you can block anything,' that's what Coach Znayu says."

"That's the UN's motto, too," Ray said. He thought for a moment as he worked liniment into her sides. Stick together. What if the UN didn't stick together? And—what was that smug comment Nyquist had made? Something about trying to benefit from the UN's advice. Yes. Things clicked. "I've got an idea."

She sighed happily. "I'm half-naked and you've got your hands all over me. Of *course* you've got an idea."

"OK, so I've got two ideas," Ray said, feeling encouraged by her words. "That economist, what's-her-name—"

"Grace Carver."

"—do you think she'd mind working as a part-time consultant for a kya firm?"

"When she's feeling better." Elizabeth turned over and looked at him. "Why? What have you got in mind?"

"A way to hoist Nyquist on his own petard. *And* make a profit. That's three ideas."

"One idea at a time," she said. "What are you going to do to Nyquist?"

"Blackmail him," Ray said. "Would you say Nyquist has good intentions?"

"Well—yes."

"Of course. So does the UN. He's the worst kind of do-gooder—the sort who thinks his intentions are all that matters. But if we can threaten to make him look bad at the UN, we can stop him cold. And I know just how to do it. I'll just need the cooperation of Jones and a few kya."

"Good." She turned over, reached up and started unbuttoning his shirt. "Now let's hear about your first idea."

Ray visited Ghorf's office the next morning, and spoke to one of the people in his office. "Having just left to, er, inspect one of our farms, Ghorf isn't here," the kya said. "Being Zhlah, his secretary, I'm authorized to discuss business with you."

" 'His secretary'?" Ray repeated. It worried him that Ghorf wouldn't see him. No doubt about it, the executive was avoiding him. "Well, let's talk. Applying Earth technology to your farms, I wanted to talk about a problem this may create."

Zhlah sniffed in puzzlement. "Being a good thing, how can increased productivity be a problem?"

"Easy," Ray said. "Suppose you suddenly have twice as many crops to sell. What happens to prices and profits?"

Zhlah sniffed again, this time thoughtfully. "I catch the scent. There's a glut and the market stampedes over the nearest cliff. Saying this, do you think we should break the contract with Moskva Mnogowhatever?"

"No," Ray said. "We humans have had similar problems. Having an expert on economics working at Vrekle, you might want to consult with her on possible courses of action. She may see a way for you to increase production and profits without importing some expensive technology."

Zhlah's ears pricked up at that. "Hearing that, I'd like to discuss things with her. I must say, it's good of you to think so much of our needs."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Well, it isn't all my idea," Ray said. "A lot of the credit has to go to Ambassador Nyquist."

"The Ambassador?" Zhlah exhaled rudely. "He's been nothing but trouble."

"It only seems that way, Zhlah." Ray smiled as he prepared the ambassador for a fall. "I'd say he's really interested in helping Kya, despite his orders from the UN. To be honest, he was the one who warned me to look into the consequences of our business arrangements, and to pay attention to our planet's experience in such matters."

"Indeed?"

"Indeed," Ray agreed. "If it weren't for him, we wouldn't be talking right now. He may have turned a potentially disastrous situation into one that will profit all of us." Ray smiled at his own careful misstatements of the truth.

"Hearing this, I'd say we were wrong about the fellow," Zhlah said. "Hearing that, Ghorf will be happy."

"I'm sure," Ray said. "Would Ghorf mind saying that to a reporter? You see—er, you scent, the ambassador is in a bit of trouble back home, and it would help all of us if the folks on Earth knew what a help he's been."

"A human reporter?" Zhlah sniffed uncomfortably. "Well—Ghorf being busy, it isn't convenient. Being his closest-following assistant, would I do?"

Ray smiled again. "Yes, you'll do nicely."

"You're cutting this close," Jones said. She checked her watch as Ray led her and her cameraman to the UN embassy's front entrance. "The game starts in three hours. That barely gives us enough time to get back to Vrekle."

"I know," Ray said. He clutched his notepad in much the same way that an ancient tribesman might hold a magic talisman. "But we can't leave Nyquist any time to react."

They entered the lobby, where Delores sat working behind her desk. "Go away," she said without looking up.

"We can't do that," Jones said. "I'm here to interview the ambassador. I've already had several kya testify about his activities, and I thought I'd give him a chance to comment."

Delores glowered at Ray. "You're behind this, aren't you?"

"Maybe," he said. "Why don't you let the ambassador know we're here?"

Delores thought for a second, then flicked her thumb at a door. "You can wait for Mr. Nyquist in his office. Alone."

Ray glanced at Jones and the cameraman, then gave in. He entered the office, took one of the ornate seats in front of the expansive oak desk, and waited.

Nyquist steamed into his office a half-hour later. "This had better be good, Bennett," he said. "What have you got? Some kya complaining about UN policies?"

"Let me show you," Ray said. He set his notepad on the desk and pushed the *display* tab. A holographic image appeared above the desk: Jones and Zhlah. *"I'm surprised*



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

*to hear you praise the ambassador,"* Jones's simulacrum said. *"I'd understood he opposed giving Kya any help."*

*"That being your UN's policy, he has often seemed unreasonable,"* Zhlah said. *"But despite this he has given the Easthills Combine some advice which will not only make it easier for us to hire human scientists, but also to employ your agricultural techniques with a minimum of trouble. Knowing this, we feel most grateful to him. Thanks to Ambass—"*

Nyquist reached out and stopped the playback. "What's your game, Bennett?"

"You should listen to the entire interview," Ray said. "Zhlah praises you to the skies. We've got a similar interview with Dean Zelk, too. You see, they know you've been secretly working against the UN's interests, dropping veiled hints as to how they can get around UN restrictions—"

"That's a lie!"

"Is it?" Ray asked. "They believe it. So does Jones. She's worked up a full report, and she's already submitted it to Earth—and because you won't let her transmit the game, GSN has a lot of dead air to fill. You see the problem? Once the UN hears you've double-crossed them, you'll be out of here faster than a cat at a dog show. I don't want that any more than you do."

Nyquist boggled. "You *what?*"

"I won't deny that I used to think you were lower than a snake's navel," Ray said. "But when I realized how you'd been carefully slipping me advice on how to beat the restrictions, I saw I was wrong. And, let's face it, you haven't actually *done* anything to interfere with my business—just a lot of razzle-dazzle that makes you look like a UN flunky."

"You're blackmailing me," Nyquist growled.

"Huh?" Ray did his best to look innocently puzzled. "No, sir, I'm protecting our interests. We both want to help the kya. But if you don't reverse that UN decision and let Jones do her broadcast, they'll air those interviews and—"

"I'll call headquarters and explain that those interviews are false," Nyquist said.

"Good idea," Ray said. "But will you be able to convince them? We both know how the UN works. There's bound to be some jackal who'd love to knife you in the back. Even a false report like this could give your enemies a chance to—"

"I get the point." Nyquist ground his teeth, then banged his fist down on the desk's intercom panel. "Delores. Tell that GSN woman she can do her show." He punched the panel again as Ray turned off his notepad. "Get out of here, you reptant blackmailer!"

Ray smiled and took his notepad. "Keep up the good act, Mr. Ambassador."

"It's the biggest crowd we've ever had," Zelk told Ray as the game began. Cheerleaders on the sidelines were throwing team-scented powders into the air while various clusters of kya rooted for their team. Out on



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the field, Elizabeth and seven kya were dragging a dingy, grass-stained bag toward a goal line, while a remote camera coasted above them. "Having almost twice as many spectators as usual, I'm overwhelmed."

"Not all of them seem happy," Ray said, spotting one group of kya. They carried large, *papier-maché* bones and mimed gnawing them. Ray didn't need to be an anthropologist to understand what they thought of the human presence.

"Oh, belch," Zelk said in annoyance. "Now everyone's going to know there's a split in the student body over human students."

And the dean was concerned with appearances, Ray thought. "Get some students together," he suggested, "and have them pass the word that what they're *really* doing is taunting the other teams—threatening to eat them alive with a human player."

"That's the most disgusting thing I ever heard," Zelk said.

Ray smiled. "No, it's the most disgusting thing you ever heard the *protesters* say."

Zelk's muzzle wrinkled in appreciation. "Phrasing it like that, it *could* make them smell foolish. Taunting the other teams being rude, the sort of thing that can disrupt their playing, they'll never live it down—and it will make them smell loyal to Vrekle, too, in a demented way. If you'll excuse me?"

Ray smiled as she went away. Taking care of the protesters hadn't been on the schedule, but it made a nice bonus to the day. Of course, the main event was yet to come—unless Nyquist had decided to tough it out.

After one of the breaks in the game Ray went to the open-air broadcast booth, where Jones and a retired bag-drag player were giving a commentary to the Earthside audience. "It's the end of the fourth fifth," Jones was saying, "With the score tied at six, six, and six, with one stench—foul, that is, against Flerk Polytechnic."

"Dad's ride," the player said in his version of English, "end it leafs Vrekle plus Bnurx in a god position three drat the hag across their mutual coal line and scare two pints. Weal come left bat rafter a weird from your sponsor."

One of the technicians made a chopping gesture. Jones took off her headset and gestured for Ray to come closer. "Not a bad game," she said. "Lots of action, no long time-outs between plays, and with all that padding on her your girlfriend is a lot more photogenic than I expected."

"Do you think it's worth covering the rest of the season?" Ray asked.

"Big Mac will think so, if these ratings hold." She nodded at the computer terminal on her table. "The autorating system says our viewership has been going *up* throughout the game. Staying here might not be such a bad idea," she mused.

"I thought you wanted to get off this 'dirtball'?"

Jones shrugged. "If I can go home with higher ratings, I'll wait. Besides, that redhead at the embassy is OK, once you get to know her."

"You mean Delores?" It surprised Ray that anyone could like her. On the other hand, he mused, maybe Jones



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

could drive a wedge between Nyquist and his henchwoman. The day was looking better and better.

"Delores, right," Jones said. "We're having dinner tonight, unless Nyquist pulls something rotten. You heard from him yet?"

"No."

"I'm worried," she said. "He doesn't seem like the sort of man who submits to blackmail. What's he got up his sleeve?"

"It doesn't matter," Ray said. "I'll handle him."

Jones looked dubious, but the cameraman flashed her a thumb's-up before she could comment. "And we're back at you, live from Kya," she said, putting her headset back on.

Out on the field, the three teams had resumed their positions around the bag. Vrekle and one of the other teams had combined forces, and their line swept away the third team's players as their carriers dragged the bag over a goal line. It all looked like a mountain on the move, but that sight was nowhere near as imposing as the spectacle of Nyquist, forcing his way through the throngs of kya spectators toward Ray. "Well, Bennett," he said cheerily as they came face to face, "Sorry I had to miss the start of the game, but I had to do a little housekeeping."

" 'Housekeeping'?" Ray repeated.

"I had to clean your clock." Nyquist smiled nastily. "I found out that Jones never sent a taped interview to Earth, and GSN doesn't report on anything but sports. You bamboozled me into letting you broadcast this game, but I guarantee it's the last trick you'll pull. You're being deported. You'll leave on the next ship."

"Don't say good-bye just yet," Ray said. "You'll be coming with me. Watch." Ray drew his notepad from his pocket and played back a recording. A simulacrum of Nyquist's office appeared. *"This had better be good, Bennett,"* Nyquist's image said as he entered his office. *"What have you got? Some kya complaining about UN policies?"*

*"Let me show you,"* Ray's image said. The Ray-image produced a notepad and placed it on the ghostly desk.

Standing on the grass before Nyquist, Ray smiled as he turned off the notepad. "I painted over its *record* light before I came to your office, so you couldn't know I was taping our meeting. There you are, submitting to blackmail, to protect yourself. What do you think will happen if the UN sees that?"

After a chilly moment Nyquist returned Ray's smile. "I'll lose my job. You'll go to jail for blackmail. It might be worth it, Bennett."

"I wouldn't go to jail unless I returned to Earth," Ray said. "So I'll stay here. After all, my work is here, and my *fiancée* likes it here."

*" 'Fiancée'?"*

Ray gestured toward the field, where Elizabeth was trading sides on the bag with another player. "I've had a lot of good ideas lately," he said. "Now, I doubt you want to lose your job, so why don't you just back off?"

"And let you ruin this world?"

"How do you ruin a world?" Ray asked him. "I've figured out something, Mr. Ambassador. Things change."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Is that supposed to be brilliant?"

"Understanding it is," Ray said. He gestured at the field. "Thousands of years ago, that was how they fought over food. Now it's just a game, because they developed agriculture and don't have to fight over food any more. Or should they have preserved their culture and stayed in little nomadic herds that fought over scraps of food? That's as unrealistic as saying Neolithic humans should have stayed in the caves."

"You really don't care how much harm you do here, do you?" Nyquist asked in disgust. "You're just rationalizing everything."

"I'm trying not to," Ray said. "I'm only saying that change is part of everyone's culture, and so is learning how to deal with change. I'm saying—"

Nyquist spoke an undiplomatic word. "You'll get away with it this time," he said, "but *next* time, I'll nail your hide to the wall." He turned and started to stomp away, then looked over his shoulder, determined to have the last word. "And you'll still destroy their world." He vanished into the crowd of kya.

No, I won't, Ray thought. There was a secret to surviving the hazards that change brought on. Elizabeth had survived her allergies by coming to Kya. Zelk had learned to bend the rules when Faber brought on his crises. Ray had managed to hold things together despite the curves that McIlvaine and Nyquist had thrown him. The secret of surviving in an unpredictable universe was to keep your wits about you. Simple, he thought, but Faber and Nyquist hadn't managed it.

The crowd cheered a play on the field. Returning his attention to the game, Ray saw that Vrekle now had sole possession of the bag. Over the crowd's rumbling gronks he heard Jones shouting out the score—eight, eight and six, with Vrekle tied with Bnurx and in a position to score the winning point, what a *game,* you poor geeks oughta *be* here—while on the field, the opposing two teams lined up to take the bag away from Vrekle.

Ray could barely watch as Elizabeth and seven teammates pounded toward their home goal. The opposing teams charged them *en masse,* a stampede which he thought would have sent John Wayne running home to his mommy. Vrekle's defensive line went down under the onslaught, and the offense swept over the bag.

Ray looked for Elizabeth while the referees charged into the confused, milling players. He expected to see her removed from the field on a pizza platter, but when a knot of players moved out of the way he saw her still clutching the bag with one hand, while she waved her other fist in the air. The crowd went wild, and over the din Ray heard Jones shout something about Vrekle retaining the bag. Apparently, Ray thought, a team kept possession if even one player kept a grip on the bag—and Vrekle was now within yards of its own goal line.

What came next baffled Ray. The outrunners scurried around the field, and in a moment Vrekle had given up sole possession of the bag. "What's



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

going on?" Ray asked the nearest kya.

"We're sharing the bag with Flerk!" she said in excitement. "What a play, what a play!"

"I don't get it," Ray said.

Ray didn't get a response, as the play began and the crowd went wild. Out on the field the offensive and defensive lines collided, and the bag carriers plowed through the chaos to plunge across the goal line Vrekle shared with Flerk. Time ran out then, and the crowd surged onto the grassy field to celebrate the end of the game. Jones shouted out the score—ten, eight and eight—while her co-anchor, overcome with excitement, gronked incoherently in his own language. As Ray forced his way through the mob toward Vrekle's bench area, he wondered if Vrekle had won. None of the fans had the dejected air of losers he would have seen on Earth.

Whatever had happened, the Vrekle players were ecstatic as Ray caught up with them. "Are you all right?" he asked Elizabeth as he got hold of her.

"I'm fine," she gasped. "I could—get to like—doing this."

"How did you manage to hang onto the bag in that one play?" Ray asked.

She started to get her breath back. "I just grabbed my handle like it was Nyquist's throat," she said. "After that, it's like explaining how a Republican can get elected President. It defies all logic, even when you see it happen."

One of the Vrekle players had overheard their talk. "Bouncing into me, I absorbed most of her momentum," he explained. "Good playing, Shevield, and it let our outrunners negotiate a classic play, just classic!"

"Way out in front!" another player chimed in. "Being so, let's just hear anyone dare to sneeze out another complaint about human students at good old Vrekle!"

Ray steered her toward the broadcast booth. "Did we win?" he asked her.

"We did," Elizabeth said. "Even better, we won *right.* We and Bnurx had eight points. Flerk had six. By sharing the bag with Flerk, we scored two points and so did they. That means they came out of the game tied for second place with Bnurx, instead of ending up in third place. Their pride isn't hurt, and we look more sporting."

"So everyone wins." It was, Ray noted, a typical kya attitude toward competition. "But you were in a spot to score an easy point on your own goal, instead of making that long run down the field. What if it hadn't worked?"

"Then we'd have tied for first with Bnurx, which means Flerk would still have come in second and everyone goes home happy. Speaking of going home, what about Nyquist?"

"I handled him the way you would have, by the throat," Ray said. "We can stay. Now come on, Jones will want to interview you."

They were pressing their way through the crowd when Ghorf came up to them. "Rabinet!" he called, and gave a friendly bow that was marred by some jostling. "Coming to see the game, I thought I should drop by for a few words."

"I'm glad you did," Ray said. He felt



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

oddly apprehensive when he recalled how the executive had been avoiding him—and there was something unsettling about the way his muzzle twitched, as though he was reluctant to deliver bad news.

Ghorf's words belied that impression, however. "I wanted to talk about the Moskva contract," he said. "Consulting with Zhlah, she thinks that—that—ah—ah—"

Ghorf struggled to stifle a sneeze, lost the fight, and doubled over as he let loose an explosive string of sneezes. He gronked out a noise that might have been "Excuse me" as he staggered away, still sneezing.

"I'll telephone you later," Ray called after him, as he vanished into the crowd.

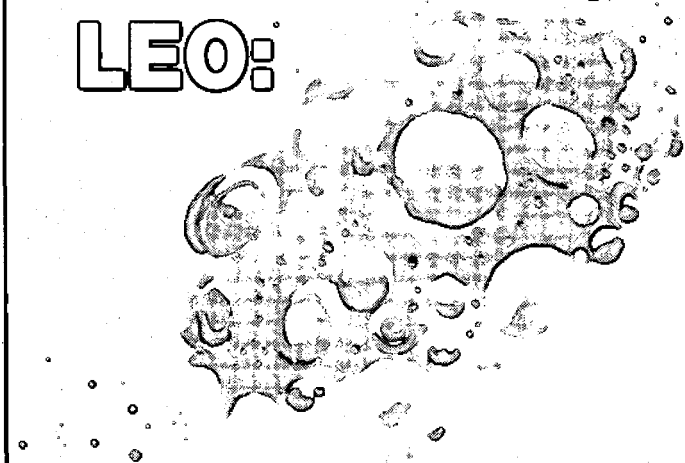
Elizabeth shook her head in sympathy. "Poor fellow . . . but now we know why he's been avoiding you."

Ray nodded. "At least I can still deal with his secretary face-to-face." That would be out of the question for Ghorf, who, Ray now saw, was allergic to humans. ■

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Gregory L. Matloff

# ESCAPE FROM LEO:



## AN OPTION FOR THE 1990s

Illustration by Vincent Di Fate

I am one of those engineers who grew up with the space program—not the watered-down ventures we call space exploration today, but the real explorations of the 1960s and '70s. I entered college with the Mercury astronauts, graduated with *Gemini,* and began my aerospace engineering career with *Apollo.*

If asked in 1965 or 1967 where we would be in 1995, I might have said in



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

a lunar colony, a base on the Martian surface or an experimental colony/factory ship among the Earth-approach asteroids. Never would I have suspected that, after testing the cosmic waters and the strange soils of the Moon, we would return to Low-Earth-Orbit (LEO) to endlessly circle around and around.

As our spacefaring capability and understanding of this new ocean have improved, our collective will to explore seems to have correspondingly shrunk. Our astronauts now venture forth on short, timid missions aboard an overpriced, cumbersome and dangerous space freighter that was initially advertised as having the capability of one flight per week with a cost to orbit of $10 per pound and an accident rate of one fatality per 10,000 missions. The cosmonauts of the former Soviet Union have fared somewhat better—in Mir and its predecessor Salyut space stations, some of them have lived in the weightless environment of near-Earth space for more than a year.

Yes, Russian spacefarers have rehearsed interplanetary travel. But perhaps chagrined by the failure of their former economic system, they too seem to be trapped in LEO. Maybe something can be done in the new world economic climate, as American shuttles climb to Mir to begin its expansion (or incorporation) into a global space station, to break this bottleneck in space exploration.

Like many other survivors of the early space program, I have learned to be very adaptable. I've worked in astronomical research, environmental consulting, and academia as well as engineering. As well as having picked up a Ph.D. along the way, I've authored many publications on interstellar travel. Some have appeared in the *Journal of the British Interplanetary Society* (JBIS) or as AIAA (American Institute of Aeronautics and Astronautics) or IAF (International Astronautical Federation) preprints. But whatever notoriety I've gained has much to do with *The Starflight Handbook* (Wiley, NY, 1989) that I co-authored with Eugene Mallove.

Even the amount of fame garnered by an astronautical author has its drawbacks. In recent years, I have often received unsolicited manuscripts from astronautical-engineer "wannabes." A few months ago, I received such an unsolicited proposal, from an author identified only as "The Midwest Amateur Futurist," and decided to check the calculations. To my surprise and delight, the idea bears merit. It may possibly point the way towards the expansion of human exploration beyond LEO, even before the conclusion of the 20th century.

### *The Proposal of the Midwest Amateur Futurist (MAF)*

This bold interplanetary proposal was not sent to me alone, but to several other contributors to astronautical thought—including Doug Beason, Robert Bussard, Eric Drexler, Freeman Dyson, Robert Forward, Jerry Pournelle, Stanley Schmidt and Robert Zubrin. MAF proposes use of that tried and true space station, the Salyut, as a deep-space craft. Salyut has proven capable of supporting



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

crews of two or three for periods of a year or longer and could be delivered to LEO by the Proton rocket or conceivably, the Space Shuttle.

In the MAF proposal, all of the material necessary to project the Salyut on 1-year roundtrips to nearby deep-space destinations such as Earth-crossing asteroids could enter LEO aboard a single Space Shuttle. The MAF-recommended mode of propulsion above LEO is the magsail of Dana Andrews and Robert Zubrin (see R. Zubrin's article in the May 1992 *Analog*).

My consideration of MAF's proposal proceeds as follows: (1) First, I'll examine the Salyut and what might be required to convert this early space station into a deep-space vehicle. This will include estimates of additional radiation-shielding required by inhabited spacecraft above the Earth's magnetosphere and a check of MAF's life-support estimates. (2) Next, I'll examine the magsail. Is this superconducting device, initially suggested as a brake for interstellar spacecraft, adequate for propulsive requirements in the inner Solar System? What should magsail research concentrate on to prove feasibility and are there any alternatives to the magsail? (3) Finally, I'll review some of the literature regarding those objects that could be explored by a spacecraft capable of carrying humans beyond the Moon in the near future.

### *The Salyut as an Interplanetary Habitat Module*

A common misconception among Americans is that Skylab was the first space station. Actually, *Salyut 1* entered orbit in 1971, about two years before the first NASA station. Although the three cosmonauts of *Soyuz 1* succeeded in boarding the first space station and living aboard for almost three weeks, they died during reentry when air leaked from an improperly sealed hatch.

Author Phillip Clark has reviewed the history of the Salyut stations after that inauspicious beginning. After the test flight of a military version of the Soyuz ferry in 1972, the Soviets failed in their first attempt to orbit *Salyut 2*. The backup *Salyut 2* finally reached orbit in April 1973. Partial disintegration of the new station occurred on April 14, during automatic orbital maneuvers.

In September of that year, *Salyut 3* was successfully orbited. The cosmonauts of *Soyuz 14* docked with the station and remained aboard for two weeks. Due to a docking failure aboard the next Soyuz, this was the only visit to *Salyut 3*.

About the time that the *Salyut 3* mission was terminated, the civilian *Salyut 4* was inserted into LEO. On January 10, 1974, *Soyuz 17* was orbited with a two-man crew who spent a month aboard the new station. After the launch abort of *Soyuz 18-A*, the crew of *Soyuz 18* spent two months aboard *Salyut 4*.

The final military station in the USSR program was *Salyut 5*. Two Soyuz crews lived aboard the station during 1976 and 1977, in six- and three-week duration missions.

In late 1977, Russia launched the



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

first of its "second generation" space stations. Many crews of two and three persons visited this *Salyut 6* complex and its successor station *Salyut 7*. These stations were routinely resupplied by robotic Progress vehicles and were visited by guest cosmonauts from many countries. Some of the long-term station residents spent more than a year aboard, spinning around and around the Earth.

We see from the ample Russian experience that the Salyuts and the Mir station that was derived from them are quite capable of supporting a two or three person crew for a year or more in LEO. But are these stations capable of safely carrying people more than a few hundred kilometers from Earth?

One major difference between LEO and deep space is the shielding effect of Earth's magnetosphere. When one moves from a point within a few hundred kilometers of Earth's surface to a much more distant location—say the vicinity of the Moon—he/she is exposed to penetrating radiation from both the Sun and the Galaxy. Although someday a device like the magsail may be capable of deflecting energetic electrically charged particles from a spacecraft's crew compartment, electromagnetic shielding has not yet been demonstrated in practice.

For the immediate future, mass shielding is the most reliable way to go. Fortunately, we need not design our interplanetary forays around the multi-meter mass shields of the L-5 Colony designs. A research group directed by Rein Silberberg of the Naval Research Laboratory has estimated shielding requirements for peopled spacecraft by assuming a 50 rem/year or 200 rem/10 year tolerable cosmic-radiation dosage for volunteer astronauts. They concluded that a 9-cm thick aluminum shield would be effective even in reducing radiation from very energetic solar flares experienced by an interplanetary crew to tolerable levels.

A 9-cm thick aluminum shield reduces the expected interplanetary annual radiation dosage rate from protons, neutrons, heavy ions and secondary particles to about 35 rem. Of course astronauts exposed to this annual dosage will not be as safe as those in a more-heavily shielded Lagrange-point colony. An occupational hazard to deep-space flight might be a slightly greater cancer risk.

As Clark mentions, the *Salyut 1* station was divided into several sections. The cosmonauts would first enter a transfer compartment from their Soyuz ferry and then proceed into a cylinder 3.8-m in length and 2.9-m in diameter. A conical frustum 1.2-m in length connected this compartment to a larger cylinder 4.1-m in length and 4.15-m in diameter. Most of the cosmonauts' time was spent in the smaller of the two cylindrical chambers, which contained such amenities as a tape recorder and small library. Refrigerators, sleeping bags, and sanitary facilities were included in the larger cylindrical work compartment.

Much of the radiation-shielding required on an interplanetary voyage could be supplied by water and food for crew consumption and scientific



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

equipment. Let's assume that, as a backup, it is required to also shield the smaller, of the two Salyut cylindrical work compartments with 9-cm aluminum. Since aluminum has a specific gravity of 2.7, the shielding mass required is easily estimated as 8,500 kg.

At least for some of the voyage, life-support consumables can serve as additional radiation shielding. From Mitchell Sharpe's classic 1969 reference on space life support, an astronaut requires 0.9 kg/day of oxygen, 3.6 kg/day of drinking water, and 0.6 kg/day of food. With a 30% contingency and no environmental regeneration or recycling, the consumable life-support mass for a 400-day mission and a two person crew is 5,300 kg. A three person crew requires about 8,000 kg for the same mission duration.

Not counting the masses of Soyuz ferries, Progress supply craft and add-on modules, the on-orbit mass of the Salyut stations are given by Clark as 18,900-20,000 kg. Launched from Cape Canaveral, the Space Shuttle is reported by Robert Powers to have a maximum payload capacity of 29,500 kg. Thus, one shuttle launch could deliver the shielded-Salyut to near-equatorial LEO. A second shuttle or Progress mission would be necessary to loft the required consumables.

NASA SP-407 lists the dimensions of the Shuttle's payload bay as 18-m long X 5-m diameter. Any of the Salyut stations would handily fit within the Shuttle's payload bay. Of course, much work would be required to ensure compatibility between the Shuttle and Salyut systems.

With a single resupply mission, it seems likely that an interplanetary version of Salyut capable of supporting a two-three person crew for a 400-day interplanetary mission could be placed in LEO. I next consider the feasibility of the magsail as the primary propulsion mode.

### *The Magsail and Alternative Modes of Interplanetary Propulsion*

The goal, of course, is reliable and low-mass propulsion during an interplanetary mission. The approach to this goal that is favored by MAF is the magsail (or magnetic sail).

Magsails were initially considered for interstellar, not interplanetary flight. The idea evolved from an earlier idea perhaps invented by the author and Alphonsus Fennelly in 1974—the interstellar superconducting ion scoop.

Imagine a thin-film ring of superconducting material in interstellar space. The diameter of the ring (or solenoid) is of the order of kilometers and a strong supercurrent rushes around it in the near-absolute-zero temperatures of the interstellar medium. The ring is aligned perpendicular to the spacecraft's motion. Magnetic field lines emanate from the interior of the ring and project for a great distance in front of and to the sides of the spacecraft's trajectory. Interstellar charged particles over a great radius are "frozen-in" to the supercurrent-generated field. These ions gyrate around the field lines and ultimately approach the ship.

Using the primitive plasma-physics



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

codes of 1974, Al Fennelly and I were not able to determine what happens when the charged ions closely approach the supercurrent ring. Do they enter the ring, which then can function as a "ramscoop" for the interstellar ramjet or are they reflected? The major contribution of Dana Andrews and Robert Zubrin in their first magsail paper was to demonstrate that an interstellar magsail acts as a very effective drag brake for a starship by reflecting the interstellar ions.

But can we use a magsail near the Sun to propel a spacecraft by reflecting the ions of the solar wind (or by direct interaction with Earth's magnetic field in LEO)? Technologically, the idea does not seem to be infeasible. We might utilize the "two-sail" concept of Giovanni Vulpetti and shield the superconducting ring from sunlight using a highly reflective solar (photon) sail. High temperature superconductors are required, but since the late '80s, materials have been developed that can remain superconducting above 100 K.

The big problem, however, is the approximations required in the theoretical plasma codes. While not questioning the utility of the magsail in interstellar space, Vulpetti now believes that the very complex plasma and magnetic environment of the inner Solar System may render the device much less applicable for interplanetary flight.

This question will not be answered by a "shoot-out" between the Andrews/Zubrin and Vulpetti plasma codes. Instead of more theory, we need an actual test of the magsail in LEO. In the same manner as a test solar photon sail was deployed some months ago from Mir station, a space-qualified magsail must be deployed from the Shuttle or Mir. If such an experiment demonstrates that the magsail can provide lift in the LEO plasma environment, the way will be clear to design interplanetary missions around this propulsion scheme. Even if the test is completely successful, the highest-temperature existing superconductors will require thermal shielding in the inner Solar System. This will increase magsail mass.

There are a number of propulsive alternatives to the magsail, some of which have been surveyed by Robert Salkeld, Donald Peterson, and Jerry Grey. Drives useable between LEO and interplanetary destinations such as Earth-approaching asteroids include the solar-electric drive and the solar-thermal rocket.

In the solar-electric, or ion drive, sunlight is converted to electricity that is used to accelerate ions of cesium, mercury, or argon. This low-thrust system slowly spirals up from LEO to escape the influence of the earth, accelerates towards the interplanetary target, and finally decelerates towards rendezvous. Exhaust velocities above 100 km/sec are quite feasible for solar-electric drives. The total mass of propellant, thrusters and power-processing units need not more than double mission mass.

Unlike solar-electric rockets that have been tested in space, the higher-thrust solar-thermal rocket remains a theoretical concept. Sunlight is focussed to heat a hydrogen working



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

fluid that is expelled from the craft at up to 10 km/sec.

If a small reusable rocket tug is used to move the modified Salyut from LEO to 1,000-2,000 km high orbit, the solar photon sail can be used. Except for its vulnerability to atmospheric drag near the Earth, current-technology Earth-launched solar sails could give the interplanetary Salyut the freedom of space desired by MAF.

The performance of all these drives (including the magsail) will be greatly enhanced by intelligent trajectory design. The total velocity increment (Delta-Vee) for a mission to a near-Earth asteroid has been estimated by Brian O'Leary to be 9-13 km/sec. Only a fraction of this kinetic requirement need be met by the spacecraft's propulsion system.

One form of sophisticated trajectory that will be available is the multiple-planet gravity assist, such as those used to accelerate the *Galileo* probe towards Jupiter after Earth-escape. Another approach is the Sun-perturbed weak-stability trajectories developed from Chaos theory by Edward Belbruno and used to save the mission of Japan's *Hiten* Moon-probe with a great saving in on-board propulsive requirements.

It is not unreasonable, therefore, that a minimal interplanetary Salyut-based spacecraft constructed and outfitted from two or three Shuttle payloads could perform near-future round trips to nearby Earth-approach asteroids. But what might we find there and what are the justifications for the investment required?

* * *

### *Near-Earth Asteroids and Why We May Visit Them*

Recent observational work has taught us a great deal about these small worlds. According to Carl Sagan, a few thousand small worlds a kilometer or so in diameter circle the Sun on paths that at least occasionally take them near the Earth. There may be hundreds of thousands 100 meters or larger in diameter.

Sometimes, near-Earth asteroids strike the Earth. We can view evidence of ancient asteroidal impacts in places like Meteor Crater in Arizona and modern events such as the 1908 Tunguska fall in Russia. The catastrophic impact of an object a kilometer or so in diameter may have ended the reign of the dinosaurs 65 million years ago. Some of the few hundred Earth-approach asteroids that have been identified to date can be visited in round trips of a year or so.

Iron-rich, stony and organic-rich Earth-approach asteroids have all been found. Some asteroids have small satellites, others seem to be formed from low-energy collisions of two several independent bodies. We may learn much about the Earth's formation from early expeditions; some of these small worlds can be colonized and others can be productively mined.

But perhaps the best justification for early peopled expeditions to the near asteroids is the long-term survival of our civilization. Last summer's impacts of fragments from Comet Shoemaker-Levy 9 in the atmosphere of Jupiter has underscored the realization that small worlds in the Solar Sys-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tem can destructively interact with larger ones. Searching for a post-Cold-War mission, military planners have suggested that nuclear-tipped rockets can be used to protect terrestrial civilization from these cosmic interlopers.

If an asteroid is detected tomorrow on a collision course with Earth, there will be little debate. We may have no alternative but the nuclear missile.

However, if there is more warning time, it seems prudent to learn something about an errant asteroid before attempting its destruction. Is it a solid body or a loosely gathered agglomerate? Is a nearby nuclear blast likely to divert it—or merely break it up into a collection of radioactive fragments, all targeting the Earth? Crewed missions seem necessary to answer these questions and also to test the feasibility of more gentle solar-powered techniques to alter the paths of asteroids targeting the Earth.

Finally, humans need to explore. If we develop and test an interplanetary capability in Earth's backyard, we may ultimately expand it for visits to more distant low-gravity objects such as the Martian moons and main-belt asteroids. With robot-equipped bases gradually built up on the Martian moons, in-situ materials may ultimately be mined to support actual expeditions to the Martian surface.

### *Conclusions*

And so, MAF, we see that your proposal may be of great benefit. No, we may never be able to construct interplanetary craft capable of year-long space flights that can be deployed from a single space shuttle. But two or three shuttle launches seem adequate to support minimum expeditions of two- or three-person crews to the near-Earth asteroids. Use of existing Russian hardware will certainly greatly reduce costs as well as contributing to the spirit of international cooperation.

Defending the Earth from asteroidal impacts may require peopled missions. The legacy of these early flights will be long-term space commercialization and habitation.

Many of our myths and traditions are based upon the exploits of small crews of sailors in crude wooden ships. Our first crews to the near asteroids may provide inspiration for the myth-makers and story-tellers of centuries to come.

### *REFERENCES*


I. Amato, "New Superconductors: A Slow Dawn," *Science, 259,* 306-308 (1993).

D. Andrews and R. Zubrin, "Magnetic Sails and Interstellar Travel," *JBIS, 43,* 265-272 (1990).

E. A. Belbruno and J. K. Miller, "Sun-Perturbed Earth-to-Moon Transfers with Ballistic Capture," *Journal of Guidance and Control, 16,* 770-776 (1993).

G. H. Canavan and J. Solem, "Interception of Near-Earth Objects," *Mercury, 21,* 107-109 (May/June 1992).

P. Clark, *The Manned Soviet Space Program,* Salamander, NY (1988).

R. S. Hudson and S. J. Ostro, "Shape of Asteroid 4769 Castilla (1989 PB) from




LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Inversion of Radar Images," *Science, 263,* 940-943 (1994).
R. A. Kerr, "An Asteroidal Family Adds a Little One," *Science, 264,* 35 (1994).
M. Laques, X. M. Xie, H. Tebbji, X. Z. Xu, V. Mairet, C. Hatterer, C. F. Beuran, C. Deville-Cavellin, "Evidence Suggesting Superconductivity at 250 K in a Sequentially Deposited Cuprate Film," *Science, 262,* 1850-1851 (1993).
LBJ Space Center, *Space Shuttle,* NASA SP-407 (1976).
G. L. Matloff and A. J. Fennelly, "A Superconducting Ion Scoop and its Application to Interstellar Flight," *JBIS, 29,* 775-785 (1976).
B. O'Leary, "Mass Driver Retrievals of Earth-Approaching Asteroids," in *Space Manufacturing Facilities II,* ed. J. Grey, AIAA, NY (1977).
D. Morrison, "The Spaceguard Survey: Protecting the Earth from Cosmic Impacts," *Mercury, 21,* 103-106 (May/June 1992).
R. Powers, *Shuttle,* Stackpole, Harrisburg, PA (1980).
C. Sagan, *Pale Blue Dot,* Random House, NY (1994).
R. Salkeld, D. W. Peterson, and J. Grey, eds., *Space Transportation Systems 1980-2000,* AIAA, NY (1978).
M. R. Sharpe, *Living in Space,* Doubleday, Garden City, NY (1969).
R. Silberberg, C. H. Tsao, J. H. Adams, Jr., and J. R. Letaw, "Radiation Hazards in Space," *Aerospace America, 25,* 38-41 (1987).
F. Smith, "A Collision Over Collisions: A Tale of Astronomy and Politics," *Mercury, 21,* 97-102 (May/June 1992).
S. Stephens, "Smash it Up!-Modeling a Comet's Collision," *Mercury, 23,* 7-11 (March-April, 1994).
A. Van Den Berg, Y. Koleshnikov, R. Novosti, V. Baberdin, and N. Kidger, "Space Station News," *Spaceflight, 36* 146-156 (1994).
G. L. Verschurr, "This Target Earth," *Air & Space,* 88-94 (October/November 1991).
G. Vulpetti and M. Pecchioli, "The Two Sail Propulsion Concept," IAA-91-721.
G. Vulpetti, "A Critical Review on the Viability of a Space Propulsion Based on the Solar Wind Momentum Flux," *Acta Astronautica, 32,* 641-644 (1994).
J. L. Wright, *Space Sailing,* Gordon and Breach, Philadelphia, PA (1992).
R. M. Zubrin, "The Use of Magnetic Sails to Escape from Low Earth Orbit," *JBIS, 46,* 3-10 (1993).
R. M. Zubrin and D. G. Andrews, "Magnetic Sails and Interplanetary travel," AIAA-89-2441.

## About the Author

Currently affiliated with the City University of New York, New York University and the New School for Social Research, Dr. Matloff has authored two books on popular astronomy [*The Urban Astronomer,* Wiley, NY (1989) and *Telescope Power,* Wiley, NY (1993)] as well as many contributions to interstellar mission planning. He lives with his wife, the artist Constance Bangs, in Brooklyn, New York. ■



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# Murder On Moonbase

*The first major crime on a new world.*

### The Only Law Above the Ionosphere

RENSSELAERVILLE—The Asimov Seminar for 1995 will be held August 5-9 at the White Eagle Conference Center in Hamilton, NY. The setting will be Moonbase, an internationally-staffed lunar facility in the mid-twenty-first century. The participants will have to determine the facts surrounding the incident in question, and attempt to apprehend a suspect. They will then hold a grand-jury like inquiry to decide what laws apply, and what the suspect can be charged with. Moonbase is a creation of Ben Bova, renowned science fiction author and past Editor of *Analog* and *Omni* magazines. Ben has worked for the space program and will be helping the Asimov Seminar program committee secure experts in the fields of forensic investigation and SF and mystery writing to compose a panel of advisors. With their help, the participants will bring the miscreant to justice and make Luna safe for all Moonbase residents.

### The Asimov Seminars

In 1972 Isaac Asimov was invited to speak at a public program held at The Rensselaerville Institute. Charmed by the surroundings, he returned yearly. This lecture series evolved into what is today the Asimov Seminar. The Asimov Seminar spans four days late in the summer. The topics have included the nature of artificial intelligence, the economics of bio-engineering, and the politics of global warming. The character of the program is largely speculative or futurist.

During the Asimov Seminar, you don't just attend, you participate. Every topic poses both a technical challenge and an important social problem. These are broken up into manageable tasks, each handled by a small group of participants, usually playing loosely defined assigned roles. There are no right or wrong answers to these questions. If it is thought out well and convincingly presented, a group's proposal can alter the course of the entire seminar.

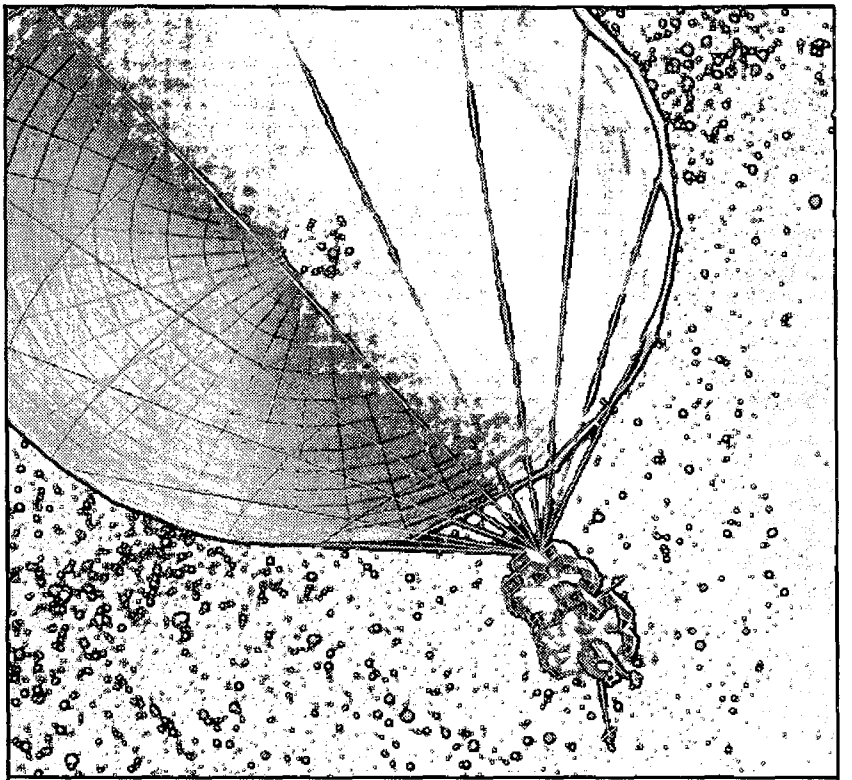
Early evenings are reserved for formal lectures. As experts in relevant fields, these lectures are provided by the Seminar advisors, which supplies solid background for the participants.

The whole session is not taken up by work on the given topic. There are plenty of opportunities for hiking, swimming, boating, tennis, and other recreational activities. Occasionally these activities include cross-country croquet and "Calvin Ball."

Whether you are an expert or novice and your interest is in technological or social issues, join us for four days of fun, conversation, and debate. You are guaranteed to learn something new while meeting interesting people at the Asimov Seminar.

Contact: Doug Loss,
The Asimov Seminar, P.O. Box 54,
Rensselaerville NY, 12147
Phone: (717) 389-4797
Fax: (717) 389-4001
E-mail: loss@husky.bloomu.edu

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



Joseph J. Lazzaro
& Peter L. Manly

# BEN FRANKLIN'S SPACESHIP

*"Power" means one thing to a physicist and another to a politician—but they're not all that far apart!*

*Illustration by William R. Warren, Jr.*

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Silence on a spacecraft is a heart-stopping sound, for it means the air scrubbers have ceased working. Captain Jakeson snapped his eyes open and in the dim emergency lighting saw his clothes floating in a free-fall in the center of his cabin.

"Damn! The engines are dead!" Holding onto the edge of his bunk, he stabbed at the intercom button to call: "Bridge!"

The speaker remained silent.

He glanced out his window and saw that the giant saucer-shaped antenna was still intact. She looked like an umbrella towing a beer can. *Franklin* was the first electric powered spaceship, driven by microwave energy beamed across space. She converted the radiant energy into electricity, powering the ion engine complex. He had felt proud to be her master, setting new records of speed and endurance. The *Franklin* was the only ship that could travel under constant acceleration, a fact that was driving the other aerospace transportation and supply companies out of their collective minds. It also changed the economics of Earth-Mars travel, substituting high-value goods for their usual passenger load. Indeed, a good chunk of the company's net worth was tied up in this single cargo. Because of the sheer value of the mission, Jakeson had resigned himself months earlier to the possibility that his brand new ship just had to be the target of corporate and political intrigue.

Fear, determination, and a slight edge of anger filled his mind. He knew that in space, fear dulls your thinking and ultimately can kill. While easing out of the bunk he ran down a mental checklist that would isolate the cause of the power failure, and if it turned out to be sabotage he'd track it to the source with a vengeance.

Nobody screwed with his ship and got away with it!

He mentally backed up and reminded himself that the ship was of a new design and that all the bugs might not have been ironed out. He groped for the emergency flashlight and reviewed his position. With the engines out, the ship was well past turn-over, more than halfway to Mars. They were on battery power and could last only a short time.

Then a scraping noise from the stateroom entrance caught his attention and he heard the engineer ask: "Captain? You in there?"

"Yes, Smitty. Come in."

Jakeson stood as the engineer opened the door. "All the displays just died. No intercom either."

"You got any idea what caused this?"

"Not yet, Sir. Can't tell anything until we get the computers back on-line. We're working on that now."

Jakeson pulled himself toward the stateroom door. "Have you seen any other crew?"

"Just Vinnie in the galley. He said he'd stay put until he's needed somewhere else."

Jakeson paused at the ladder leading upward. "Get back to the engineering section, and get ready to feed a report to Jonesie. I'm heading for the bridge."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

The emergency lights provided dim illumination at best, but he preferred their feeble glow to the total blackness of space. He tried to reason out the situation calmly, clinging to his training. He was damned sure that it was not yet time for the *Franklin* to go into free-fall. The computer had not announced any divergence in the flight plan, either routine or emergency, which normally proclaimed all course changes. He rifled through his brain, trying to come up with an answer.

The ship's basic structure was not *that* complicated. Had the antenna complex malfunctioned, or lost its link with the transmitter? Or maybe one of the individual engines had failed, causing a system shutdown? There was no way to determine the trouble without the computers, and valuable seconds had already ticked away. At least he hadn't heard or felt an explosion.

This was one of the "quiet" failures.

Glancing up the ladder which ran the length of the ship, he saw a shadowed face looking down helplessly and bellowed: "You know what happened?"

"No, Sir, I—"

"Then stay put up there!"

He gently pulled himself up and headed for the bridge, hoping to find answers in the ship's control center.

The bridge had a telescope and the communications antennas; the rectenna and ion engines were forward of that. He moved onward. There were no other crew members on the ladder to be seen, and he hoped they were all at their emergency stations by now. After what seemed to be an eternity he entered the bridge, its normally bright displays and computers all dark. The emergency lights barely lit the chamber, giving the scene a ghastly appearance as he spotted First Officer Suzanne Jones.

"Report!" he snapped.

Jonesie waited at her command console, a look of controlled concern playing across her face. "The first thing to determine is whether an engine failed, the rectenna malfunctioned, or if the beam stopped. I can't give you any answers until the network comes back on-line. For the moment, we're running on emergency battery power."

"But why are the computers down?" Jakeson asked peevishly. "Aren't the damn things running on uninterruptable power supplies?"

"Yes, they are, sir. I don't have a good technical explanation. Perhaps a power spike went through the system?"

"Well, reboot the damned things and let's have some answers."

"I'm working on that. But it'll be a few minutes, sir."

There was nothing to do but wait, and Jakeson grudgingly strapped himself into his command seat, glaring at the dark display screens. He rolled his eyes to heaven, knowing how finicky computers could be, and with life hanging in the frigging balance. He could operate computers, but didn't eat, sleep, and breathe the machines like Jonesie did. She was a total computer geek if there ever was one.

After a time, Jonesie floated over to Jakeson's station. Her face showed some relief, but she still looked as if she'd tasted sour milk.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"We've managed to get the computers back on-line. Good thing someone around here does triple backups. From all the data, it looks like Earth's orbital power station simply isn't transmitting any longer."

"You're sure it's not a problem on board the *Franklin?*"

"Yes, sir. The orbital microwave beamer must be out of action."

"Hmmm." Jakeson frowned. "I really don't like that answer. We can only rely on battery power for a few days, and that's only if we take almost everything off-line."

"That's my recommendation, sir."

"Get ready to send a signal then. I want to transmit our current status back to base, and find out what the hell's happening back there."

Jonesie pulled herself back to her station. Flipping several switches, she spoke to Jakeson decisively. "You're on the air!"

Jakeson used few words in describing their current situation. They were without engine power, but with no obvious structural damage. They were running on emergency battery power, but that power could last only a few days at best. He also requested an immediate status report from base. Then, as he locked the handset into place, he queried the revived computer and found that the message would take six minutes to reach Earth. It would be at least twelve minutes before he could expect an answer.

He looked up at Jonesie. "Keep the channel open. They may have already transmitted an explanation before we sent our question."

The minutes dragged on. Smitty reported the intercom back on-line, adding that the engines were operational—they just lacked power. Twelve minutes came and went and stretched to fifteen, and just as Jakeson was about to transmit a second, heated request for information, the channel came alive.

"Um, *Franklin* this is Beamer. Your message is received and we'll . . . ah, get back to you. Beamer out."

Before he could build up a good, angry head of steam for a retort, it occurred to him that the orbiting microwave power station, Beamer, might be in the middle of its own emergency. He could envision them handling a fire or a blowout, not able to take time to answer his radio messages.

"Jonesie, sounds like Beamer's got a problem. Can you swing the high gain antenna over toward Earth and see if we can pick up any local signals?"

"Aye, Sir!" Her hands flew across the keyboard as she watched her displays. She listened quietly for a few minutes, her face cold sober. "Sounds like normal radio traffic to me." She shifted frequencies several times. "If Beamer had a problem they'd be screaming for help, but all the emergency frequencies are quiet."

"Well, then, see if you can get me a link to corporate headquarters. I need to know what's going on!"

Several minutes later Jonesie reported: "Sir, I can't get into our usual relay satellite. I think they changed the transponder codes."

Jakeson knew the ship was



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

equipped with puny radios which could be heard only by the company's privately owned satellite with special antennas and he glared at the microphone. "Ain't it great working for the cheapest company in the System?" Then he stopped to consider his options.

"Try to raise Mars," he suggested finally. "They're closer to us anyway."

"I'll try, sir, but they aren't expecting a message from us so I doubt their antenna is pointed in the right direction. Furthermore, we're no longer following our planned trajectory since the engines shut down. Even if they wanted to call us they'd point at a place thousands of kilometers from where we actually are."

"Well, give it a try anyway. And see if you can pick up any news broadcasts. I'm going below."

"Aye, sir."

Jakeson was floating in the engine maintenance bay when Jonesie reached him. "Sir, there's a news broadcast I think you ought to hear. I'm recording it."

Jakeson pressed the intercom button. "I'm on my way."

He pulled himself into the bridge and she said: "I'll rewind the recording."

The speaker came to life: " . . . while stock in the tiny Martian company has tripled in value. . . ."

Jonesie reached for the controls. "Oops. Rewound too far. It's the next one I wanted you to hear."

"Let it play!" Jakeson barked.

The broadcast played on: " . . . invented a new process for the manufacture of solar cells with twice the efficiency at one-tenth the cost. In other news, Space Ventures announced they may be having trouble with their new cargo ship, the *Ben Franklin*. The experimental spacecraft has not been heard from in five days. Even though her skipper is an experienced spacer, company officials fear the worst."

Jakeson lowered his brows and thought. For the past four days he had sent in regular reports and they had been acknowledged as usual. Something was fishy. Now he found he couldn't communicate with the company or anybody else.

"Jonesie, I think we just heard our own obituary."

She gaped at him, astonished. He looked up and said, "Pull up the cargo manifest on your screen. I'm going to look over the ship's papers." When he returned to the bridge he asked: "What's the highest value cargo we have?"

She ran a finger down the screen. "Well, for a single lot about a third of the cargo mass is power system components for the Mars colony. After that, um, the medical equipment is pretty expensive. The rest is construction stuff to expand the colony. It's things they can't make yet for themselves."

Jakeson studied the ship's papers for a moment. "You know, Jonesie, we're more valuable dead than alive. Those power system components in the cargo bays are just solar cells, and with the new ones coming on the market they aren't worth a tenth of what the company paid for 'em." He



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

waved a sheaf of papers in her face. "But the cargo is fully insured and the ship, too. If we reach Mars then the company loses a bundle."

"Sir, they wouldn't—"

"I think they already did."

He pressed the intercom button. "Smitty, get up here. Have I got an engineering job for you!" When the engineer arrived, Jakeson asked him: "Smitty, did you ever wonder why they collect solar power in Earth orbit and beam it to the ship rather than mount the solar collectors on the ship?"

"Yes, sir, I did. I believe the answer was that they could switch power from ship to ship more easily and they could sell unused power while we were docked and loading."

"Yes, I bought that excuse myself. But I think the real reason was to exercise control. They have the on/off switch in their hands."

Smitty sighed, and then brightened after a moment as he scribbled some notes on a piece of paper. "I think I may have a solution to our little problem." He held up the note. "These are just some preliminary calculations, but I think we can vacuum-weld the solar collectors in cargo to the microwave antenna and power the ship's engines. We'll get only about half the thrust but we've got enough consumable supplies to get to Mars."

Jakeson grinned. "Exactly my own idea, but I hadn't carried the design as far as you have. Get working on it. Use any available crew." He turned to his first officer, "Jonesie, see if you can't rig one of our radios to the high gain antenna. At some point we're going to have to talk to corporate headquarters. And keep an ear on the news. I expect they'll have a nice funeral service for us and I don't want to miss that!"

A month after her scheduled arrival, the ship sidled up to Phobos Station and startled the Mars traffic controllers.

"Good to see you, *Franklin*! We thought you were lost."

"Just a little detour, Phobos," Jakeson replied. "We took the scenic route."

Jonesie interrupted: "Sir, I have an urgent call from corporate headquarters on Mars."

"Tell 'em to wait."

"Aye, sir!"

Jakeson got himself a squeeze-bulb of coffee, paced the ship and thought hard before returning to the bridge to accept the call.

"Put 'em through."

The video screen lit up to show a fat little man sitting there with a forced smile on his face. "Captain Jakeson! What a pleasant surprise to see the ship and you, alive."

Jakeson had met this corporate hack twice before. Deevers was a mid-level manager in charge of acquisitions who didn't have a sincere bone in his body. After the earlier meetings, he had wanted to wash his hands. It felt good to be on the offensive.

He leaned forward and smiled back. "I understand that your company considers us dead. Do you have business with us?"

Deevers appeared at a loss for



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

words. "Um, why yes! We thank you for delivering our cargo to Mars orbit."

" 'Our' cargo? Let me cut to the bottom line. You and your corporation no longer own either this ship or its cargo. Two days ago you received the largest insurance payment ever for an 'irretrievable' shipping loss. Legally, the ship was then salvaged by us."

Deevers sputtered. "But, but, you are our loyal employees. You were working for Ventures at the time."

Jakeson smiled. "Loyal employees? I bet you cut off our salaries on the same day you cut off the microwave beam!"

"Now please, Captain, I'm sure we can clear up this little misunderstanding. I'd like to—"

"CAN IT! We have no business to conduct." Jakeson reached for the cut-off switch."

"Captain, if you're claiming the ship? That's mutiny!"

Jakeson winked at Jonesie. "No, this is not mutiny. It's only mutiny if the *crew* revolts against the commanding officer, not if the commander revolts against the powers that be. I am being insubordinate, not mutinous. There's a difference." He grinned.

Deevers looked like he was close to having a heart attack. "You don't think you have a chance in hell of winning, do you? Our legal staff alone is larger than 85 percent of the registered corporations."

Jakeson's smile got bigger. "I don't have to win, just keep this ship tied up in the courts until the Moon develops her own atmosphere." He leaned back in his command chair and tapped his fingers. "Tell the company they can buy back the cargo at fifty cents on the dollar. That's a real bargain, and the price will be seventy-five cents on the dollar tomorrow. The price goes up accordingly each day. And if they don't buy the cargo, tell them that I'm sure the settlers would love to get their hands on it for ten cents on the dollar." ■


**CUSTOMER SERVICE OR SUBSCRIBER ASSISTANCE**

Please direct all changes of address and subscription questions to:

**ANALOG SCIENCE FICTION AND FACT**
**P.O. BOX 5133**
**HARLAN, IA 51593-5133**




LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

He opened his eyes to a vision: she sat before him, the woman whose smile could light a galaxy.

Although Ross Herrick smiled at her, she did not move. Although he murmured a greeting, she did not reply.

A reply would have astonished him. She was, after all, just a picture—a



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Marc Stiegler

# KATH IN WINTER

*Learning a whole new way of thinking, after a long life of an old one, is hard. But with a big enough nudge. . . .*

*Illustration by Steve Cavallo*

picture of the greatest actress ever to grace the Silver Screen. The present Kath didn't look like that photo any more, of course; the photo was sixty-two years old, and the living, breathing Kathleen Tepper was but an ember of the woman he now gazed upon.

By all accounts, however, she still sparkled. Her fire might now be an



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ember, but it was a shining ember indeed. Their mutual friends had told him this, though he himself had never met her.

He would meet her soon. Tomorrow, in fact, when he would attend a party. The hostess had promised that Kath would appear.

Ross glanced at the clock, noting the time with horror. He went into hyperdrive, pulling on khaki slacks, struggling to pull a polo shirt over his muscular shoulders, grabbing his leather jacket and duffel, and tugging a comb through his dark curls as he ran out the door to his Jeep. His plane for Seattle left in less than two hours. He wanted very much to meet Kath, and this would probably be his only chance. She was, after all, very old now. She couldn't have much time left.

Kath fought off the sharp pain that stabbed behind her eyes, and examined herself in the mirror one last time. The scarf around her throat did an excellent job of disguising the progressive collapse of her neck muscles. Without the scarf, she looked like an aged turkey; but with the scarf in place, she looked more like her vision of herself. The word "spry" popped into her mind unbidden. *Kath,* she said sternly to her reflection, *five years ago you would have withered anyone who called you "spry" with your famous patrician glare.* She reviewed her present assets—she was still tall and slender, and osteoporosis had not yet distorted the straight iron of her back. Her mind was as sharp as . . . she stuck her tongue out at herself, fluffed her once-famous locks, and stepped out into the melee. At least, she viewed it as a melee, though the other participants no doubt thought it was a party.

She had never been much of a party-hound; she liked them even less now. Consequently, she always astonished herself on the rare occasions she accepted such invitations. But her grand-nephew Timmy was trotting off upon a long journey, and her niece Dolly had begged her to come and see him off. And since Kath considered it a good possibility that Timmy'd get himself killed on this expedition, she figured she could acquiesce this once. After all, even if Timmy did survive his attempt to climb Everest, Kath herself might not be around to celebrate his return. The thought displeased her enough to force her into the bright defiant smile she had perfected when Spence died, long ago.

Still, there was a positive aspect to attending a party thrown in honor of mountain climbers. They were a healthy lot, strong, vigorous and handsome in their own way. She enjoyed watching them . . . even if watching was all she did nowadays. She remembered the days when she would have— "Aunt Kath, I'd like you to meet someone," Timmy spoke from stage right, just outside her field of vision.

She turned to him. "What's that, Timmy?" she asked, not having heard him clearly. *Hah, and people wonder if I'm senile!* she thought to herself. *No wonder,* she concluded sourly.

"Kath, this is Ross Herrick, the leader of my expedition." Timmy


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

stepped back and a new character—no doubt this Mr. Herrick fellow—moved forward. He extended his hand. She could see, even without her glasses, just how rough—and how strong—his hand was.

Kath adjusted her social smile, took the proffered hand, and said, "A pleasure, I'm sure, Mr. Herrick." She looked him over, and her smile grew warmer. He fit her stereotype for climbers to a degree—he *was* strong, and he had a dancer's grace about him. But he was rather short, and plain rather than ruggedly handsome. Still, his smile lit his countenance, and dark hair and eyes had always caught her fancy. Spence, now—

He covered her hand with his other hand. "Meeting you is a great pleasure for *me,* Miss Tepper." He looked away and laughed, as to himself. "At the risk of sounding trite, I must tell you that I have fallen in love with you at least a dozen times, in your different characters."

"Goodness me, Mr. Herrick, you'll make me blush." She could feel it, too—she *was* blushing, of all absurd things. She couldn't quite understand why, and she conceded to herself that she was sadly out of practice at this game. While Mr. Herrick was not by any means the first person to offer her such lavish, and silly, praise, his eyes were so dark with their intensity, it made her feel . . . warm . . . and. . . .

Suddenly the warmth turned to ice in her stomach. His eyes, Mr. Herrick's eyes, reminded her of Spence. Spence could always make her blush. "Of course, whatever greatness I achieved is ancient history, Mr. Herrick. As you must know, I retired when cybervid made film obsolete, twenty years ago."

His eyes were still upon her. "I know, Miss Tepper. Frankly, your absence is cybervid's loss. I, for one, prefer the old films."

This Mr. Herrick was a most impertinent man! She concentrated hard on controlling her throat, to suppress the frail quaver that had encumbered her voice over the past decade, and set forth to put him in his place.

She affixed him with her finest highbrow stare, long enough to ensure that he understood his fate. She turned away and strolled to Dolly's southeast bay window. It was a crisp evening; in the distance she could see Mt. Rainier, its stark white glaciers glowing in the twilight. As she had known he would, Mr. Herrick followed her, a moth too near a flame to save himself.

Kath watched the dusk slide up the flanks of the mountain. Spence had often compared her to Mt. Rainier; both of them were volcanoes, he would say, cloaked in wintry snow.

Mr. Herrick whispered reverently, "She is beautiful, isn't she? The view from her peak still dazzles me, even though I have been there many times."

Kath cleared her throat, and proceeded to the attack. "It amazes me, Mr. Herrick, every time I hear about people ready to commit acts of suicide, like climbing mountains, when there is no need."

Mr. Herrick picked up the gauntlet


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

quite smoothly. "All people contemplate acts of suicide, Miss Tepper—even you."

Kath responded in her best theatrical voice. "Why, I should say not! I demand, Mr. Herrick, that you produce examples."

Mr. Herrick's eyes pondered her, as he formulated his answer. Kath smiled serenely. *Do your worst,* Kath thought with glee.

"You are letting old age kill you," he said quietly.

Her hand rose reflexively toward her throat; but she forced her hand down and glared at him instead.

He continued. "Death is on the verge of becoming obsolete. But typically, people of *your* age—" he glared back at her, challenging her in his turn—"people of *your* age reject the alternative to death out of hand. As if the alternative could be any worse." He stopped, and waited for her reaction.

"And just exactly how would one avoid death, Mr. Herrick?" *Could he actually be a follower of one of these New Age religious groups? Surely not! Not a man with Spence's eyes, please, no.*

"Cryonic suspension." His voice was still quiet, but very intense. His intensity put her in mind of religious fanaticism, but somehow "cryonic suspension" didn't sound very religious. If anything, it sounded coldly mechanical.

She couldn't decide whether she was puzzled or irritated, but whichever she was, the quaver returned to her voice as she asked, "And would you please enlighten me as to the nature of 'cryonic suspension'? Or would you rather prolong my suspense?"

"Suspension is the process of being frozen cold enough to preserve the body. Once suspended, you can wait indefinitely for science and technology to figure out how to cure the problems of aging . . . and also to figure out how to restore you from your suspended state."

"I see." Kath raised an eyebrow. "From your phraseology, may I presume that no one has yet been 'restored'?"

The mountain climber's shoulders sagged from a weight no muscles could hold up. "I'm afraid not. Still, suspension gives one a chance to survive. It seems likely—or at least possible—that science *will* eventually figure out how to get one back. Given the nature of an advance that revolutionary, one can reasonably take it a step farther and predict that restoration of the body will restore youth, into the bargain. I believe the technology to achieve this is just a matter of time, not feasibility. As people in the field say, being suspended is the *second* worst thing that can happen to you."

Kath did not reply immediately. Could it be true? Science had done amazing things in her own lifetime. She remembered horse-drawn carts from her childhood, yet she had also watched men land on the Moon. She did have faith that science would do amazing things after she was gone, could it truly perform even this miracle? Mr. Herrick was so certain! Just like herself . . . just like Spence.


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Damn him!

The pain stabbed behind her eyes again. She stepped back, involuntarily, leaning against the wall for a moment with her eyes closed. But she recovered quickly, and said, "Perhaps being suspended is even the third worst thing that can happen."

"Are you OK?"

"Yes, just a touch of vertigo—it comes and goes." She rubbed her eyes. "Tell me why you're so sure that science will triumph over death."

He pursed his lips. "Well, I know that they've already brought at least one man back from death."

"Really," she said skeptically. "I had no idea. Has he become a zombie?"

Mr. Herrick laughed. "No, he's just a normal man. He died during an operation to save him from a brain aneurism."

Pain stabbed her again. "A brain aneurism?"

"Yes, it's a weak spot in a blood vessel wall. The wall expands, and eventually bursts. In the brain, it will kill you when it bursts. The condition was considered inoperable until just recently."

"Why?"

"If you operate, you'll spill as much blood as if the aneurism burst."

"Not a pretty picture," Kath said.

"No, but they saved him anyway—though they had to kill him first."

"My heavens!" Kath reached for a mocking tone, but her sense of wonder hampered the effect.

Nevertheless, Mr. Herrick caught her intention. He frowned at her . . . and then caught the laughter in her eyes, and laughed himself. "I take this subject very seriously," he said, "I'm sorry if I'm boring you. It's just that . . . of all the people in the world I would like to see restored and renewed . . . the very first would be you."

She blushed again. *Oh my, another grandiose, gratuitous compliment,* she thought. But he still looked so intense, so like Spence, even when he laughed. "Go on," she said, "I'm listening."

He looked at her for a moment.

"You were telling me about how they killed the man with the aneurism," she reminded him.

"That's right. Well, when they put him on the operating table, the first thing they did was lower his body temperature to 60 degrees."

Kath shivered, though the room was toasty warm. "That would kill me, all right."

"And by most standards, that in itself would have killed him, since his heart stopped and they had to pump blood with a machine. But that's not all they did. After all, even at 60 degrees, if they operated they'd still spill plenty of blood. And he would still die a real death. No, the cooling in this case was just a preliminary step. The astonishing step came next: they removed all his blood."

"All of it?" she asked, truly astonished for the first time since . . . for a very long time indeed.

He smiled. "All of it. You see, the reason they had lowered his body temperature was to slow the rate at which the cells of his body consumed oxygen. They estimated that, at 60 de-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

grees, he could survive for almost an hour without any blood in his body, without any side effects."

He paused, as if expecting her to figure it out from there, and sure enough, Kath understood. "So since there wasn't any blood in his body, they could go in and operate on the aneurism without any bleeding."

"Exactly," he said, smiling. "And after they repaired the blood vessel wall, they pumped his blood back in, raised his temperature and—"

"And he woke up feeling like a zombie."

Mr. Herrick smiled. "Probably. He certainly met the basic requirement—after all, for an hour he had been dead by every clinical measure of death ever devised. He had no heart-beat, he had no brain activity, he was as lifeless as the diamond in your earring."

"And he's fine now?"

"Very much so."

"Well, Mr. Herrick, that certainly is an impressive story. Truly a miracle of science. But, ahhh, I seem to have forgotten: What exactly was the point?"

"The point was that this man survived for an hour preserved by the cold, without even a drop of blood in his body. So I'd hope that, given this example, you might find it more feasible to believe that by keeping you colder still, they could preserve you longer. Indefinitely, in fact—until they had the technology to make you young again."

"That could be a very long time, Mr. Herrick—after all, they would have a rather titanic job with me, wouldn't you say?"

"Hardly any job at all, Miss Tepper. It is clear that your mind is still young—and so is your heart."

Kath suppressed an urge to stamp her foot. How could that man get to her, again and again? Suddenly the pain overwhelmed her again. "Mr. Herrick," she said, putting a hand to her head, "perhaps we should continue this conversation at another . . . " and suddenly she was falling. The last thing she saw was his eyes.

The window in her hospital room had a view of Rainier—not as good as the view from Dolly's house, perhaps, but a view nonetheless. Even though the damned mountain was seventy miles away she couldn't seem to get away from it.

But even the mountain was not as tenacious as Mr. Herrick. No, indeed. She shook her head as she looked at him. "Yes, Mr. Herrick, it is an aneurism. No, Mr. Herrick, I do not need any special kind of surgery that had not been generally accepted by the medical profession."

"Very well, Miss Tepper. It's not my habit to beg people to do things for their own good." He nodded to her in polite disappointment, although it was clear that he wanted to say more. She was glad that the argument was over.

But then the silly fool got down on his knees. "Miss Tepper, I beg you, one last time, please reconsider."

"Oh, posh and nonsense!" She would have stomped her foot had she been able to stand. "I have lived my life well. The doctor says I have a little



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

time left, and that is all I want."

He stood up and glared back at her. "You aren't being rational!"

"Rationality is much overrated. Even you, Mr. Herrick, don't hold it in too high a regard, as your actions demonstrate."

A large smile crossed his face at this opportunity to replay Kath's own words back to her. "Why, I should say I do! I demand, Miss Tepper, that you produce examples."

"Very well. First of all, Mr. Herrick, do *you* have a contract for, um, let's see now, 'suspension,' as you call it?"

He reached under his shirt, pulled a chain from around his neck, and handed it to her.

She peered at the small steel medallion dangling from the chain. She moved it around, squinting, trying to find a distance where she could read it easily without first finding her glasses. Finally, she read, "Push 50,000 U Heparin IV and do CPR while cooling with ice to 10C. Keep PH 7.5. No autopsy or embalming." She looked back up at her tormentor. "Sounds rather ghastly, Mr. Herrick."

"Not as ghastly as what the worms would do to you after being buried."

She lowered her head in acknowledgment of his point. "Yes, I suppose so. Still. That's all very fine, but I'm curious: what happens if you get killed up on the mountain? Will they still be able to suspend you?"

"Probably not," he admitted. "By the time they got me down, it'd be too late. There'd probably be so much deterioration of my neural pathways, they'd never be able to put me back together again. Like Humpty Dumpty, I guess."

"How much deterioration can you suffer and still revive?" she asked.

"No one really knows," he explained, "there's plenty of reason to think that the brain has lots of redundancy. It could be reconstructed even after terrible damage. But there are surely limits, even if we don't know exactly what they are. That's why they use liquid nitrogen for suspension—they want to make absolutely sure that they're keeping you cold enough so that no further damage can occur."

Kath thought that sounded rather soft and fuzzy for such a careful and correct individual, but she decided not to press the point. "So let me get this straight. When you climb the mountain, you risk not only temporary death, but real, everlasting, permanent death, even though, if you stay here, you believe you are safe from real death." Her smile turned triumphant. "Am I correct, Mr. Herrick?"

He smiled. "Quite right, Miss Tepper. I see your point. It's not perfectly rational, is it?"

"I should say not. You see, Mr. Herrick? Rationality is not everything." *Time to go for the kill,* she thought. "Next, I'll show you just how irrational, in your own terms, you really are."

Mr. Herrick raised his eyebrows in anticipation.

"Suppose I offer you the following deal. Suppose I agreed to let some vampire of a surgeon perform this bloodless operation on me, Mr. Herrick. Would you agree, in exchange,



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

not to go on this expedition to the Himalayas?"

Mr. Herrick pondered her, laughing. "Nice try, Miss Tepper. But no," he countered, "good though it is, it is not good enough." He turned serious. "Miss Tepper . . . whether or not you have this operation makes little difference. Facing facts, you are about to die—if not of this aneurism, then of another stroke, or of pneumonia, or of any of the thousand other ills that come with old age."

"I see. Well. I suppose I shall have to up the ante. Suppose I also agreed to have a 'suspension' as you call it? Would that be enough? Would you promise never to climb a dangerous mountain again?"

This time his eyes filled with the strange intensity, the passion that reminded her so much of Spence. "Yes," he said fervently, "I'd make that deal."

She looked at him for a long moment, and knew, looking into his soul, that he was telling the truth. She had upped the ante enough, all right; indeed, she had upped it more than she was willing to pay.

"Well, Mr. Herrick, you have surprised me again. You are more rational, inside your own twisted view of the world, than I had given you credit for. I commend you."

But now he wouldn't let go. "Do we have a deal, Miss Tepper? I can call from here to cancel the expedition."

She looked at him sternly. "Mr. Herrick, I was speaking hypothetically." Settling back, she smiled tiredly. "Please do visit tomorrow. I find our conversations most, ahhh, entertaining."

"I'm afraid that won't be possible, Miss Tepper. We leave in the morning for Katmandu."

"So soon?"

"So soon, Miss Tepper." She could see in his eyes that he regretted it.

"Will I see you again?"

"That is entirely up to you, Miss Tepper. I shall be back in just a few months."

"Yes. Well . . . good luck, Mr. Herrick. I hope you reach the top of the mountain."

"And I hope you get to share it with me one day, Miss Tepper. When you are young again." With that, he departed.

Kath sighed. People made so much ruckus about living and dying. She had seen so much of both. There were certainly ways of living that were worse than dying. And yet . . . somehow, she felt her conversation with Mr. Herrick had gone awry.

So he would be back in a few months. The main question, then, was whether she would still be here in a few months. Reading between the lines of what her doctor had said, she could see that the answer was a resounding *no.*

Damn that Mr. Herrick! Clearly, she had only one path to ensuring that she would be able to finish her work upon him. Even if her doctor was acutely hostile to this bloodless operation business, she would have to pursue it. Strengthened by her irritation, she reached for the phone, to call the surgeon Mr. Herrick had recommended. She would start by asking the man whether he liked draining


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the blood out of people, that should get them off to a nice start.

The room was cold, as cold as the light was bright. Both features heightened her irritation. Kath sat stiffly upright on the rolling bed that would take her into the operating room and contemplated her folly. Dying most certainly would have been simpler than this wretched undertaking. She blamed her failing memory for the error: she should have at least remembered how much she detested doctors. After all, what had doctors ever done for her—except stick needles in her and generally make her uncomfortable, and then tell her that she was sick, which she had known all along anyway. And then there were those hospital bathrooms. Had she ever spent time in a hospital when she was able to go to the bathroom like a normal person?

But here she was again, less than a month after her last incarceration. She had no doubts about whom to blame.

It was that Mr. Herrick's fault. She would settle with him the next time she saw him, when he returned from his mountaintop. Assuming he made it back from his mountaintop, that is. The last she had heard (cleverly asking Dolly how her son was, rather than asking any questions specifically about Mr. Herrick), he was above 20,000 feet, making good progress. He was also hurrying because a truly wicked storm was brewing there. She had no idea what a storm might be like at 20,000 feet, but it sounded even more unpleasant than this hospital hallway.

Well. Mr. Herrick was not the only one facing imminent destruction. In minutes they would whisk her away to the operating room, where they would, as their first step, kill her. Supposedly they would bring her back again within the hour, but she had much less faith in their ability to pull off that crucial second step.

There was some good news. At least, whichever way it went, she would get some relief. The pain was continuous now, and for several days she had been seeing double.

A ridiculously cheery fellow in uniform—not a hospital uniform, however—interrupted her reverie. "Miss Kathleen Tepper?"

She snapped at him, though the quaver in her voice sapped most of the venom from her vocal projection. "Of course I'm Miss Tepper. Who else would sit like a ninny in this bed waiting for men with knives to come for me?"

"Special delivery from Nepal, Miss Tepper." His voice was full of amazement, though it was unclear whether he felt such awe because he stood in the presence of the famous movie star, or because he rarely carried parcels from glacial peaks halfway around the world.

"My, my, I wonder which of my friends that could be." There was only one possibility, of course, but it made no sense to admit this to the young man delivering the mail.

She signed for the package and examined it a moment before opening it.

It did not feel cold, despite its ori-


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

gins. This surprised her, despite the absurdity of the expectation.

It did not feel heavy; she could have believed that the package was empty.

Frustrated by the lack of tangible clues, she grasped the package at one end and tried to pull it apart. When that failed, a friendly hospital attendant assisted her, and soon she held the contents in her hand.

She read the note first. In his stark script, it said simply, *After we settled into camp at 16,500 feet, I went for a walk. I found this. I couldn't believe it—it was growing in a shallow crack in barren rock, surrounded by snow. I knew that it wouldn't last long, so I preserved it as best I could and sent it to you. Perhaps the winter flower will yet live, against all odds, R.H.*

She opened the box and held the flower in her hand. She had spent a couple of decades gardening, and recognized the pink petals at a glance: a fairy rhododendron. These flowers were known for their ability to survive at high altitudes, but still, this was incredible. What astonishing travails the bright blossom had survived to get here!

Kath sighed. Such a romantic, this Mr. Herrick. You'd think he'd be more practical, with death as close at hand as it was in his present circumstances.

"Miss Tepper, we're ready," another bright young attendant announced. He wheeled her away to her doom, despite her protests.

She lay floating on the sea. It was quite comfortable there, though there was something odd about it. She drifted back to sleep, but something still bothered her about her comfortableness. Eventually she figured it out: her neck muscles were too relaxed. She had been tensing her neck muscles ever since the pain behind her eyes had begun, months ago; now her muscles were relaxed, because . . . because the pain was gone! She blessed the surgeon and drifted off to sleep again.

The next time she awoke, there was a stale, dry taste in her mouth. Her body was not floating; rather, it was a lead brick, designed to keep her trapped in bed. There could be little doubt about her condition: she was a zombie now.

Either that, or she was getting better. She considered the advantages of being a zombie, and rather preferred them.

Finally she woke up, in that terribly definitive way that told her that she wouldn't drift off to sleep again soon. She complained about the coffee; she demanded, and received, a daily paper.

Reading the paper was a relatively new habit for her, only a few decades old. She hadn't started until the '90s. Before that, the headlines had always been the same: either someone was starting a war, or someone was trying to end one, or the Americans were talking to the Russians. But when the Soviet Union collapsed and the guardian B-52's descended from the skies, a void appeared in the daily headlines. Oh, of a certainty, there were still wars—probably more than before—but without the global over-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tones of Communism versus Democracy, they rarely rated headlines.

So newspapers had gone back to covering news. They created headlines out of all kinds of oddities, from the nutritional value of theater popcorn to the sexual peccadillos of the current President years before he got elected. What news had lost in grand planetary sweep, it had gained in . . . humanity. One never knew what ridiculous concoction would become tomorrow's news.

Today, however, the headline wasn't at all amusing. No, not in the least.

She threw the paper aside, and blinked repeatedly; there were tears in her eyes! Damn him!

Well, Mr. Herrick was no doubt already receiving damnation from experts. There was little she could do to punish him any more. A massive avalanche had crashed down the side of Everest, burying half of the American climbing team. The team leader, Ross Herrick, was among those lost.

Contrary to her desires, Kath continued to recover. But as her body's automatic physical process marched towards healing, her will to live faded.

Everyone and everything was gone. *I have long outlived my usefulness,* she thought, with only a trace of bitterness. Not even Mr. Herrick was left to argue with.

Dolly's family held a memorial service for the late Mr. Ross Herrick; Kath did not attend. This was traditional for Kath: she had not even attended Spence's funeral. No, her last memory of Spence was of the love in his eyes. Her last memory of Ross Herrick would be of his arrogant, challenging glare.

After the operation, the surgeon had confirmed for her what they had done: for almost an hour, she had been clinically dead. Dead, dead, totally dead.

She had half expected to see heaven—or more likely, hell—during that hour. But there was nothing. Death was flatly, simply, absurdly . . . boring. Kath, who had spent a lifetime of fierce activity, could think of little more distasteful. But she was tired now, too tired to pound back at Death again.

And everyone else was gone.

She recovered from her operation, but not from her sense of loss. She started to lose strength and weight once again. Her darned fool doctors could find nothing wrong, as usual.

Then the magazines started to arrive at her house—magazines about cryonics. Clearly, Mr. Herrick had alerted his compatriots that he had a fish wriggling on the hook. But that was before his oh-so-permanent demise.

Kath threw the magazines away. But they kept coming. And then came one issue that tried to answer the question that Mr. Herrick had evaded with considerable vigor: *How cold was cold enough?* She smiled as she remembered him, almost squirming, so she went ahead and read the article.

But in the end the essay disappointed her. The author spent a great many words saying that nobody really



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

knew. He didn't even dance around the question as skillfully as Mr. Herrick had. Disgusted, Kath tossed that magazine into the trash.

But as the paper hit the receptacle, she realized that the uncertainty held hope. She realized that, just possibly, not all of her friends were dead. Not quite yet.

But she also realized that the one friend who might yet survive would need her to save him. And she realized that, in order to save him, she would first have to save herself.

And to save herself, she would have to travel with Death once again. She found it hard to believe that she could let Death clutch at her yet again and still slip away from him. Nevertheless, it now made sense for her to try.

Besides, as a worst case, she would finally have the chance to give the Powers That Be a piece of her mind. That, at least, was something worth smiling about.

His memory of death was quite clear, quite certain. He remembered the terrible thunder, the shaking of the ground beneath him as uncounted tons of snow and ice poured down. He remembered clinging to his ice ax, jammed in a crack, and the giant fist of snow that flung him away. He remembered falling, sinking into his own private mountain of snow. He never really hit the ground: the snow simply became ever more dense, and his progress ever more sluggish, till at the last he was no longer moving.

It had been pitch black there in the middle of a hundred tons of snow. But what his eyes could no longer see, his other senses described for him with terrible surety. He had felt the snow and its bitter coldness. A burning, tingling sensation ran quickly down the tips of his fingers. He had realized he was going to die of hypothermia. He cursed under his breath.

But his attempt to curse had failed. Only then had he realized that he wasn't breathing. The initial fall had knocked the breath out of him, and the densely packed snow had crushed his lungs. He had realized that the freezing cold would not be quick enough to kill him. He had tried to shout; but that hadn't worked, either. He had fought for consciousness, for one last gasp of air. . . .

And now he was here. No snow touched him at all. Lying there with his eyes closed, he was quite puzzled. He inhaled—and the breath came easily, no mean feat with crushed lungs. Even more puzzling, he felt warm, warmer than he had felt since he had reached the Himalayas. Of course, sometimes people felt a gush of warmth as they died of hypothermia, a merciful illusion cast by a failing body. How real it seemed now!

He opened his eyes to a dream: she sat before him, the woman whose smile could light a galaxy.

Although Ross Herrick smiled at her, she did not move. He murmured a greeting.

This time, unlike all the other times, she replied. "Well, Mr. Herrick. It has been a long time, hasn't it? Though I imagine it doesn't seem all that long to you now, does it? Indeed, if things have gone as they should, you should be rather surprised by the



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

sudden absence of snow. And the question must arise in your mind, is this heaven . . . or is this hell?" Her smile held more than a hint of wickedness, and her voice sounded rather triumphant. The quaver in her voice, he noticed, was gone; she sounded as young as she looked.

He tried to decide what to be confused about first. That voice, it was the voice of Kathleen Tepper, and those eyes, those were the eyes of Kathleen Tepper, and he had just met her a couple of weeks ago, before starting the expedition. But the face matched his old photograph of her; and what had happened to the expedition, anyway?

And Kath started laughing. "Your face!" she said, "Your range of expressions in the last five seconds has just been priceless. Ah, Mr. Herrick, you have repaid me for all the irritation you put me through."

He opened his mouth to speak —and then glimpsed the view out the window. He realized that, despite the perfection of the mimicry, this room he occupied was not his own. He knew because the view from his window was impossible—when he looked out, he did not see the mountains of Vermont. Instead, he saw the oceans of planet Earth. All of Earth, floating in a vast black starfield. He looked back at Kath.

"Are you beginning to understand, Mr. Herrick?" She laughed again. "It really is a marvelous new world. Why, I myself have a spaceship, no larger than a Coke can, that can . . . well, more of that later." She harrumphed. "You are a very lucky fellow, you know. The temperature at 25,000 feet, on the side of Mt. Everest, buried under the insulation of a few hundred tons of snow, was, as it happens, minimally adequate to preserve your body. It was so minimal as to be quite worrisome, in fact. Yours was a very difficult restoration indeed, Mr. Herrick."

He remembered the snow, and shuddered. "How long?"

"By the standards of your old life, a very long time, Mr. Herrick. But fear not; you will be back in the swing of things in no time. You will be provided with your own private tutor to help you."

"You?"

Kath nodded. "Oh, don't be too impressed with yourself, Mr. Herrick. Much of your education will not be conducted in person. You'll be using the full line of Kathleen Tepper's Educational Holoworlds to hasten your learning experience."

"Holoworlds, huh? What happened to cybervid?"

"I'm afraid I missed that whole era, Mr. Herrick. Fortunately they developed a far superior medium before reviving me. Very thoughtful of them, too."

At last, Ross began to laugh himself. He laughed until the there were tears in his eyes. "Miss Tepper . . . uh, if you're going to be my private tutor, would you mind if I called you Kath?"

"Of course not, Mr. Herrick. As a friend of mine once said, 'I think this could be the start of a long and beautiful friendship.' " Imperiously, she held out her hand. "Now get out of that bed and come with me. I have *so* much to show you." ■


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

## THE ALTERNATE VIEW G. Harry Stine

# SPACE NEWSPEAK OR KILL THE COUNTDOWN!

*War is peace.*
*Freedom is slavery.*
*Ignorance is strength.*

Those three slogans of the Party exemplified Newspeak, the official language of Oceania in George Orwell's classic novel, *1984*. The purpose of Newspeak was not only to provide a medium of expression for the world view and mental habits proper to Ingsoc (English Socialism) but to make other modes of thought impossible.

We managed to get through 1984 without allowing the forecasts of Orwell's novel to happen—we think. We may be witnessing the death throes of classical socialism based upon the tenets of materialism—maybe, but have you heard the prophets of communatarianism lately? However, Newspeak became real in another guise, Political Correctness. This has considerable effect upon us.

Words mean things—usually exactly what we presently define them to mean. They are four-dimensional. Their definitions and usage change over time. Most of us would no longer say we had a gay time at the party last night, for example. And have you noticed the new name on the state school for the deaf and blind?

If you don't believe that Newspeak is alive, well, and thriving, you haven't yet encountered the incredible power of Political Correctness in the current academic world.

Words—either in the form of spoken auditory signals or as symbols such as these appearing on the printed page—evoke specific images in our minds because we think in words. Language structures our mental processes. A Chinese *does* think differently than a Frenchman. And a Frenchman thinks differently than a German. If you have studied another language, you know that the key element in your grasp of that language is learning how to decipher the thinking pattern of the language itself.


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Then the process of learning it becomes much easier.

Therefore, I maintain, if you intend to revolutionize the existing order and break paradigms in order to change the manner in which something is perceived, organized, or accomplished, you also must change the words, phrases, and language involved. The proponents of PC know this. So did George Orwell, who first brought it to our attention in his novel.

As a result, we get to the Newspeak of space.

The language of space activities is based upon a derivative of the jargon of the military artillery officer combined with the mental concept that each space activity is a single-shot event never to be exactly repeated. When the Oldspeak of space is analyzed, it becomes apparent that we have been shooting people and things into space with long-range artillery shells.

Consider, for example, how different the language of space might have been if Jules Verne's *De La Terre a la Lune* had never been translated from the French, remaining an obscure novel by an obscure novelist. Suppose instead that *The First Men in the Moon* by H. G. Wells had been hailed as the ground-breaking modern lunar adventure novel where "cavorite" was used instead of a new and more powerful form of gunpowder. We might have cavorite-propelled spaceships today instead of bigger, better, and more efficient long range artillery shells.

Or if Fritz Lang hadn't needed a dramatic shtick to build tension, anxiety, and apprehension during the launch of the spaceship *Luna* in his classic motion picture, *Die Frau im Mond,* and thus invented the "count down" for these purposes only.

And if the United States Air Force and the National Advisory Commitee on Aeronautics (NACA) had not been forced by political pressure to react to the fact that the Soviet Union had used its intercontinental ballistic missile to shoot Yuri Gagarin into space. The USAF and NACA were prepared to keep flying the X-15 and the planned follow-on experimental airplanes higher and higher until, as Colonel Frank Everest said in 1958, "You finally look out the cockpit window and you're in space."

The guys with the real right stuff out at Edwards Air Force Base in California swallowed a very bitter pill when they learned that the NASA manned space flight program, Project Mercury, was nothing more than the pilot being treated like "Spam in a can." The pilot went along for the ride and had virtually no control over the vehicle or the flight. Experienced test pilots, used to the concept that they might not survive a given flight, were revolted by the idea that "the monkey will fly first."

As a result over the next few years, a whole new jargon specific to space flight was developed. And it didn't sound very much like the jargon of aviation.

Astronauts (not pilots) were "inserted into their space capsules" rather than climbing into their cockpits.

They flew "missions," not flights,


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

on a "mission plan," not a flight plan.

Astronauts got a "mission patch" for each of these flights. Can you imagine what the flight jacket of an Airline Transport Pilot would look like if each airline flight had its distinctive patch? (This concept would certainly keep graphic artists busy!)

Astronauts didn't run a check list before takeoff; the *ground crew* went through a count down before launch—or, as journalists with a more lurid style termed it, the "blast-off." Can you think of a better word to describe being shot into space atop thousands of pounds of high explosives?

The rocket engines weren't started, they were ignited or "fired." And once the rocket engines were burning and the "launch commit" was made, there was no turning back; If something went wrong, you fired the escape rockets and hoped you'd be thrown clear of the fireball.

Orbital maneuvering became clogged with such new terms as "transitioning," "rendezvous," "station keeping," and "de-orbiting."

When it was time to come home, the astronaut in the space capsule made a "re-entry," not an approach. The mission ended with a "splashdown," not a landing.

And once the bean-counters began to tally the bucks, the results were always given in "dollars per pound" to shoot things into or remove them from orbit.

Much has been said and written about changing space transportation so that it resembles air transportation. Spaceships *can* be designed and operated like airliners—totally reusable, quick interflight turnaround, reliability-centered maintenance, assured safety by means of redundant systems, surviving in a savable manner in the case of various aborts, and lack of single-point failure modes in the design. This is no big deal. Every airplane exhibits these factors, and so do most automobiles. However, achieving these operational factors isn't a matter of new technology; it is a matter of applying known, existing, and proven technology in an area of transportation where it hasn't been done before.

This takes a major change in thinking on the part of spacecraft designers and operating personnel.

We saw the first example of this in the McDonnell Douglas Delta Clipper DC-X. Dr. Bill Gaubatz at McDonnell Douglas Space Systems Company borrowed some airline transport design engineers from Douglas at Long Beach just up the road. The airliner engineers had a totally different approach to building a flying machine than the rocket engineers. The rocket types were concerned with getting the bird off the pad and then going back to build the next one. The airliner engineers taught the rocket engineers how to design a reusable rocket. They showed the rocketeers where to put the maintenance hatches and how big to make them so a technician could get hands, arms, body, and tools into the DC-X to fix what was behind the hatch that needed fixing or replacing.

But in spite of the fact that the DC-X broke new ground and proved that a reusable SSTO could be built and


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

operated like an airplane, it never quite made the grade all the way.

Why?

The terminology and jargon of the expendable rocket wasn't easy to replace. Charles "Pete" Conrad, the former astronaut who was the "flight director" for the DC-X, tried but was unable to shake all of the procedures and terminology involved with flying a rocket vehicle.

But the Delta Clipper Team made a start.

We must make sure that the trend continues, that space Oldspeak held over from the Apollo days is replaced, that the terminology of airplanes replaces the jargon of artillery missiles. Only when the language has been changed will we know at last that we have truly moved into a new paradigm of real space transportation.

To put it simply in terms that everyone can remember:

*Kill the count-down!*

Then proceed to replace old missile terminology with airline and airplane terminology.

This is especially important when it comes to the economics of commercial space transportation. Money becomes the significant driving factor rather than performance. Show me an airline or express package delivery company who uses "dollars per pound" as a criterion in their business plan. The airplane may take off "bulked-out" rather than "grossed-out"—the cargo for that particular flight may be sixteen bajillion Ping-Pong balls that weigh less than 50% of the airplane's cargo capability, but sixteen bajillion Ping-Pong balls are all that can be stuffed into the plane. Or the plane may depart with only 10% of its cargo bay filled with depleted uranium slugs. "Dollars per pound" doesn't make much sense for air cargo. The important number for the airline accountants and strategic business planners is *cost per flight.* And it is truly amazing what happens when *cost per flight* is applied to space transportation instead of the old dollars-per-pound number.

We will know that true commercial space transportation has arrived when we hear the following:

"Regional Control, Astra Flight Twenty-three ready for takeoff."

"Astra Twenty-three, Regional Control, roger. Cleared as filed to Space Station Fourteen. Squawk six-seven-six-two. Hold for Center release."

"Astra Twenty-three, cleared as filed. Six-seven-six-two on the squawk. We're plugs out, boiling off, and holding short."

"Astra Twenty-three, Center is ready for you. Cleared for takeoff. Climb unrestricted. Passing Flight Level Six-zero-zero, contact Center on Channel Four. Have a nice flight!"

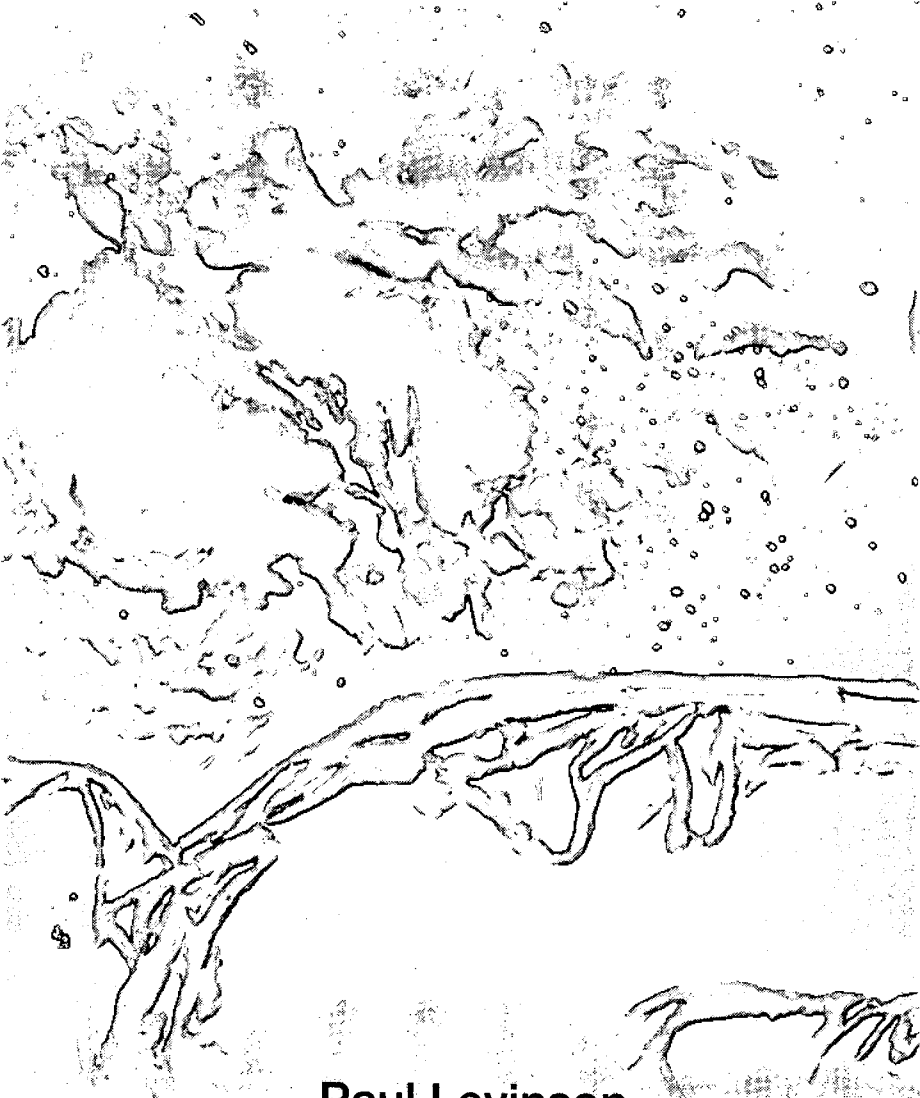
"Cleared for takeoff. Engines start. Idle thrust. All engines go. Throttle up! *Up ship!"*

And if you think that doesn't make a difference in the way you operate a spaceship, just wait and see!

This is one kind of Newspeak I can live with because when we start using it, we're on our way! ■



DOWNLOADED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



Paul Levinson

# THE CHRONOLOGY PROTECTION CASE

*Wherein the Universe gives new meaning to the phrase "Publish* and *Perish. . . ."*

*Illustration by Joseph Griffo*

LICENSED TO LINZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Carl put the call through just as I was packing up for the day. "She says she's some kind of physicist," he said, and although I rarely took calls from the public, I jumped on this one.

"Dr. D'Amato?" she asked.

"Yes?"

"I saw you on television last week—on that cable talk show. You said you had a passion for physics." Her voice had a breathy elegance.

"True," I said. Forensic science was my profession, but cutting edge physics was my love. Too bad there wasn't a way to nab rapist murderers with spectral traces. "And you're a physicist?" I asked.

"Oh yes, sorry," she said. "I should introduce myself. I'm Lauren Goldring. Do you know my work?"

"Ahm . . . " The name did sound familiar. I ran though the Rolodex in my head, though these days my computer was becoming more reliable than my brain. "Yes!" I snapped my fingers. "You had an article in *Scientific American* last month about some Hubble data."

"That's right," she said, and I could hear her relax just a bit. "Look, I'm calling you about my husband—he's disappeared. I haven't heard from him in two days."

"Oh," I said. "Well that's really not my department. I can connect you to—"

"No, please," she said. "It's not what you think. I'm sure his disappearance has something to do with his work. He's a physicist, too."

Forty minutes later I was in my car on my way to her house, when I should have been home with a pizza and the cat. No contest: a physicist in distress always wins.

Her Bronxville address wasn't too far from mine in Yonkers.

"Dr. D'Amato?" She opened the door.

I nodded. "Phil."

"Thank you so much for coming," she said, and ushered me in. Her eyes looked red, like she suffered from allergies or had been crying. But few people have allergies in March.

The house had a quiet appealing beauty. As did she.

"I know the usual expectations in these things," she said. "He has another woman, we've been fighting. And I'm sure that most women whose vanished husbands *have* been having affairs are quick to profess their certainty that that's not what's going on in *their* cases."

I smiled. "OK, I'm willing to start with the assumption that your case is different. Tell me how."

"Would you like a drink, some wine?" She walked over to a cabinet, must've been turn of the century.

"Just ginger ale, if you have it," I said, leaning back in the plush Morris chair she'd shown me into.

She returned with the ginger ale, and some sort of sparkling water for herself. "Well, as I told you on the phone, Ian and I are physicists—"

"Is his last name Goldring, like yours?"

Lauren nodded. "And, well, I'm sure this has something to do with his project."

"You two don't do the same work?" I asked.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"No," she said. "My area's the cosmos at large—big bang theory, blackholes in space, the big picture. Ian's was, is, on the other end of the spectrum. Literally. His area's quantum mechanics." She started to sob.

"It's OK," I said. I got up and put my hand on her shoulder.

"No," she said. "It isn't OK. Quantum mechanics could be frustrating, I know, but not *that* bad. Why am I using the past tense for Ian?"

"You think some harm's come to him?"

"I don't know," her lips quivered. She did know, or thought she knew.

"And you feel this has something to do with his work with tiny particles? Was he exposed to dangerous radiation?"

"No," she said. "That's not it. He was working on something called quantum signaling. He always told me everything about his work—and I told him everything about mine—we had that kind of relationship. And then a few months ago, he suddenly got silent. At first I thought maybe he *was* having an affair—"

And the thought popped into my head: if I had a woman with your class, an affair with someone else would be the last thing on my mind.

"But then I realized it was deeper than that. It was something, something that frightened him, in his work. Something that I think he wanted to shield me from."

"I'm pretty much of an amiable amateur when it comes to quantum mechanics," I said, "but I know something about it. Suppose you tell me all you know about Ian's work, and why it could be dangerous."

What I, in fact, fully grasped about quantum mechanics I could write on a postcard to my sister in Boston and it would likely fit. It had to do with light and particles so small that they were often indistinguishable in their behavior, and prone to paradox at every turn. A particularly vexing aspect that even Einstein and his colleagues tried to tackle in the 1930s involved two particles that at first collided and then traveled at sublight speeds in opposite directions: would observation of one have an instantaneous effect on the other? Did the two particles, having once collided, now exist ever after in some sort of mysterious relationship or field, a bond between them so potent that just to measure one was to influence the other, regardless of how far away? Einstein wondered about this in a thought experiment. Did interaction of subatomic particles tie their futures together forever, even if one stayed on Earth and the other wound up beyond Pluto? Real experiments in the 1960s and after suggested that's just what was happening, at least in local areas, and this supported Heisenberg's and Bohr's classic "Copenhagen" interpretation that quantum mechanics was some kind of mind-over-matter deal—that just looking at a quantum or tiny particle, maybe even thinking about it, could affect not only it but related particles. Einstein would've preferred to find another cause—non-mental—for such phenomena. But that could lead to an



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

interpretation of quantum mechanics as faster-than-light action—the particle on Earth somehow sent an instant signal to the particle in space—which of course ran counter to Einstein's relativity theories.

Well, I guess that would fill more than your average postcard. The truth is, blood and semen and DNA evidence were a lot easier to make sense of than quantum mechanics, which was one reason that kind of esoteric science was just a hobby with me. Of course, one way that QM had it over forensics is that it rarely had to do with dead bodies. But Lauren Goldring was wanting to tell me that maybe it did in at least one case, her husband's.

"Ian was part of a small group of physicists working to demonstrate that QM was evidence of faster-than-light travel, time travel, maybe both," she said.

"Not a product of the mind?" I asked.

"No," she said, "not as in the traditional interpretation."

"But doesn't faster-than-light travel contradict Einstein?" I asked.

"Not necessarily," Lauren said. "It seems to contradict the simplest interpretations, but there may be some loopholes."

"Go on," I said.

"Well, there's a lot of disagreement even among the small group of people Ian was working with. Some think the data supports both faster-than-light *and* time travel. Others are sure that time travel is impossible even though—"

"You're not saying that you think some crazy envious scientist killed him?" I asked.

"No," Lauren said. "It's much deeper than that."

A favorite phrase of hers. "I don't understand," I said.

"Well, Stephen Hawking, for one, says that although the equations suggest that time travel might be possible on the quantum level, the Universe wouldn't let this happen. . . ." She paused and looked at me. "You've heard about Hawking's work in this area?"

"I know about Hawking in general," I said. "I'm not that much of an amateur. But not about his work in time travel."

"You're very unusual for a forensic scientist," she said, with an admiring edge I very much liked. "Anyway, Hawking thinks that whatever quantum mechanics may permit, the Universe just won't allow time travel—because the level of paradox time travel would create would just unravel the whole Universe."

"You mean like if I could get a message back to JFK that he would be killed, and he believed me and acted upon that information and didn't go to Dallas and wasn't killed, this would create a world in which I would grow up with no knowledge that JFK had ever been killed, which would mean I would have no motive to send the message that saved JFK, but if I didn't send that message then JFK would be killed—"

"That's it," Lauren said. "Except on the quantum level you might achieve that paradox by sending back information just a few seconds in



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

time—say, in the form of a command that would shut down the generating circuit and prevent the information from being sent in the first place—"

"I see," I said.

"And, well, because things like that, if they could happen, if they happened all the time, would lead to a constantly remade, inside-out, self-effacing universe. Hawking promulgated his 'Chronology Protection Conjecture' —the Universe protects the existing time line, whatever the theoretical possibilities of time travel."

"How does your husband fit into this?" I asked.

"He was working on a device, an experiment, to disprove Hawking's conjecture," she said. "He was trying to create a local wormhole with temporal effects."

"And you think he somehow disappeared into this?" Jeez, this was beginning to sound like a bad episode of "Star Trek." But she seemed rational, everything she'd outlined made sense, and something in her manner continued to compel my attention.

"I don't know," she looked like she was close to tears again.

"All right," I said. "Here's what I think we should do. I'm going to call in Ian's disappearance to a friend in the department. He's a precinct captain, and he'll take this seriously. He'll contact all the airports, get Ian's picture out to cops on the beat—"

"But I don't think—"

"I know," I said. "You've got a gut feeling that something more profound is going on. And maybe you're right. But we've got to cover all the bases."

"OK," she said quietly, and I noticed that her lips were quivering again.

"Will you be all right tonight? I'll be back to you tomorrow morning." I took her hand.

"I guess so," she said huskily, and squeezed my hand.

I didn't feel like letting go, but I did.

The news the next morning was terrible. I don't care what the shrinks say: flat-out confirmed death is always worse than ambiguous unresolved disappearance.

I couldn't bring myself to just call her on the phone. I drove to her home, hoping she was in.

She opened the door. I tried to keep a calm face, but I'm not that good an actor.

She understood immediately. "Oh no!" she cried out. She staggered and collapsed in my arms. "Please no."

"I'm sorry," I said, and touched her hair. I felt like kissing her forehead, but didn't. I hardly knew her, yet I felt very close to her, a part of her world. "They found him a few hours ago near Columbia University. Looks like another stupid, senseless, goddamned random drive-by shooting. That's the kind of world we live in." I didn't know whether this would in any way lessen her pain. At least his death had nothing to do with his work.

"No, not random," she said, sobbing. "Not random."

"OK," I said, "you need to rest, I'm going to call someone over here to give you a sedative. I'll stay with you till then."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

The medic was over in fifteen minutes. He gave her a shot, and she was asleep a few minutes later. "Not random. Not random," she mumbled.

I called the Captain, and asked if he could send a uniform over to stay with Lauren for the afternoon. He wasn't happy—his people were overworked, like everyone—but he owed me. Many's the time I'd saved his butt with some piece of evidence I'd uncovered in the back of an orifice.

I dropped by the autopsy. Nothing unusual there. Three bullets from a cheap punk's gun, one shattered the heart, did all the damage, Ian Goldring's dead. No sign of radiation damage, no strange chemistry in the body. No possible connection that I could see to anything Lauren had told me. Still, the coroner was a friend, I explained to him that the victim was the husband of a friend, and asked if he could run any and every conceivable test at his disposal to determine if there was anything different about this corpse. He said sure. I knew he wouldn't find anything, though.

I went back to my office. I thought of calling Lauren and telling her about the autopsy, but she'd be better off if I let her rest. I was tired of looking at dead bodies. I turned on my computer and looked at its screen instead. I was on a few physics lists on the Internet. I logged on and did some reading about Hawking and his chronology protection conjecture.

"Lady physicist on the phone for you again," Carl called out. It was late afternoon already. I logged off and rubbed my eyes.

"Hi," Lauren said.

"You OK?" I asked.

"Yeah," she said. "I just got off the phone with one of the other researchers in Ian's group, and I think I've got part of this figured out." She sounded less tentative than yesterday—like she was indeed more on top of what was actually going on, or thought she was—but more worried.

I started to tell her, as gently as I could, about the autopsy.

"Doesn't matter," she interrupted me. "I mean, I don't think the *way* that Ian was killed has any relevance to this. It's the fact that he *was* killed that counts—the reason he was killed."

The reason—everyone wants reasons in this irrational society. Science in the laboratory deals with reason. In the outside world, you're lucky if you can find a reason. "I know it's painful," I said. "But Ian's death had no reason—his killer was likely just a high-flying kid with a gun. Happens all the time. Ian was just in the wrong place. A random victim in the murder lottery."

"No, not random," Lauren said.

She'd said the same thing this morning. I could hear her starting to sob again.

"Look, Phil," she continued. "I really think I'm close to understanding this. I'm going to make a few more calls. I, uh, we hardly know each other, but I feel good talking this out with you. Our conversation last night helped me a lot. Can I call you back in an hour? Or maybe—I don't know, if you're not busy tonight—could you come over again?"

She didn't have to ask twice. "I'll



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

see you at seven. I'll also bring some food in case you're hungry—you have to eat."

I knew even before I drove up that something was wrong. I guess my eyes, after all these years of looking around crime scenes, are especially sensitive to the weak flicker of police lights on the evening sky at a distance. The flicker still turns my stomach.

"What's going on here?" I got out of my car, Chinese food in hand, and asked the uniform.

"Who the hell are you?" he replied.

I fumbled for my ID.

"He's OK," Janny Murphy, the uniform who'd come to stay with Lauren in the afternoon, walked over. "He's forensics."

The food dropped from my hand when I saw the expression on her face. Brown moo-shoo pork juice dribbled down the driveway.

"It's crazy," Janny said. "Doc says it's less than one in ten thousand. Some rare allergy to the shot the medic gave her. It wasn't his fault. It somehow brings out an asthma attack hours later. Fifty percent fatality."

"And Lauren—Dr. Goldring—was in the unlucky part of the curve."

Janny nodded.

"I don't believe this," I said, shaking my head.

"I know," Janny said. "Helluva coincidence. Physicist and his wife, also a physicist, both dying like that."

"Maybe it's not a coincidence," I said.

"What do you mean?" Janny said.

"I don't know what I mean," I said. "Is Lauren—is the body—still here? I'd like to have a look at her."

"Help yourself," Janny gestured inside the house.

I can't say Lauren looked at peace in death. I could almost still see her lips quivering, straining to tell me something, though they were as sealed as the deadest night now. I had an urge to kiss her face. I'd known her all of two days, wanted as many times to kiss her. Now I never would.

I was aware of Janny standing beside me.

"I'm going home now," I said.

"Sure," Janny said. "The captain says he'd like to talk to you tomorrow morning. Just to wrap this whole mess up. Bad karma."

Yeah, karma, like in Fritz Capra's *Tao of Physics*. Like in two entities crossing each other's paths and then never more touching each other's destinies. Like me and this soul with the soft, still lips. Except I had no power to influence Lauren, to make things better for her any more. And the truth is, I hadn't done much for her when she was alive.

I was awake all night. I logged on to a few more fringy physics lists with my computer and did more reading. Finally it was light outside. I thought about calling Stephen Hawking. He was where? California? Cambridge, England? I wasn't sure. I knew he'd be able to talk to me if I could reach him—I'd seen a video of him talking through a special device—but he'd probably think I was crazy when I told him what I had to say. So I called Jack Donovan instead. He was an-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

other friend who owed me. I had lots of friends like that in the city. Jack was a science reporter for *Newsday,* and I'd come through for him with off-the-record background on murder investigations in my bailiwick lots of times. I hoped he'd come through for me now. I was starting to get worried. He had lots of connections in the field—he could talk to scientists who'd shy away from me, my being in the department and all.

It was seven in the morning. I expected to get his answering machine, but I got him. I told him my story.

"OK," he said. "Why don't you go see the captain at the precinct, and then come over to see me? I'll do some checking around in the meantime."

I did what Jack said. I kept strictly to the facts with the captain—no suppositions, no chronological or any other protection schemes—and he took it all in with his customary frown. "Damn shame," he muttered. "Nice lady like that. They oughta take that sedative off the market. Damn drug companies are too greedy."

"Right," I said.

"You look exhausted," he said. "You oughta take the rest of the day off."

"More or less what I had in mind," I said, and left for Jack's.

I thought *my* office was high-tech, but Jack's Hempstead newsroom looked like something well into the next century. Computer screens everywhere you looked, sounds of modems chirping on and off like the patter of tiny raindrops.

Jack looked concerned. "You're not going to like this," he said.

"What else is new?" I said. "Try me."

"Well, you were right about my having better entrée to these physicists than you. I did a lot of checking," Jack said. "There were six people working actively in conjunction with Ian on this project. A few more, of course, if you take into account the usual complement of graduate student assistants. But outside of that, the project was sealed up pretty tightly—not by the government or any agency, but by the researchers themselves. Sometimes they do that when the research gets really flaky—like they don't want anyone to know what they're really doing until they're sure they have a reliable effect. You wouldn't believe some of the wild things people have been getting into in the past few years—especially the physicists—now that they have the Internet to yammer at each other."

"I'm tired, Jack. Please get to the point."

"Well, four of the seven—that includes Ian Goldring—are now dead. One had a heart attack—the day after his doctor told him his cholesterol was in the bottom 10 percent. I guess that's not so strange. Another fell off his roof—he was cleaning out his gutters—and severed his carotid artery on a sharp piece of flagstone that was sticking up on his walk. He bled to death before anyone found him. Another was struck by a car—DOA. And then there's Ian. I could write a story on this even without your con-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

jecture—"

"Please don't," I said.

"It's a weird situation, all right. Four out of seven dying like that—and also Goldring's wife."

"How are the spouses of the other fatalities?" I asked.

"All OK," Jack said. "But none are physicists. None knew anything at all about their husbands' work—all of the dead were men. Lauren Goldring is the only one who had any idea what her husband was up to."

"She wasn't sure," I said. "But I think she figured it out just before she died."

"Maybe they all picked up some virus at a conference they attended—something which threw off their sense of balance, caused their heart rate to speed up," Sam Abrahmson, Jack's editor, strolled by and jumped in. Clearly he'd been listening on the periphery of our conversation. "That could explain the two accidents and the heart attack," he added. "Maybe even the sedative death."

"But not the drive-by shooting of Goldring," I said.

"No," Abrahmson admitted. "But it could be an interesting story anyway. Think about it," he said to Jack and strolled away.

I looked at Jack. "Please, I'm begging you. If I'm right—"

"It's likely something completely different," Jack said. "Some completely different hidden variable."

Hidden variables. I'd been reading about them all night. "What about the other three? Have you been able to get in touch with them?" I asked.

"Nope," Jack said. "Hays and Strauss refused to talk to me about it. Both had their secretaries tell me they were aware of some of the deaths, had decided not to do any more work on the local wormhole project, had no plans to publish what they'd already done, didn't want to talk to me about it or hear from me again. Each claimed to be involved now in something completely different."

"Does that sound to you like the usual behavior of research scientists?" I asked.

"No," Jack said. "The ones I know eat up publicity, and they'd hang on to a project like this for decades, like a dog worrying a bone."

I nodded. "And the third physicist?"

"Fenwick? She's in a small plane somewhere in the outback of Australia. I couldn't reach her at all."

"Call me immediately if you hear the plane crashes," I said. I really meant "when" not "if," but I didn't want Jack to think I was even more far gone than I was. "Please try to hold off on any story for now," I said and made to leave.

"I'll do what I can," Jack said. "Try to get some rest. I think there's something going on here all right, but not what you think."

The drive back to Westchester was harrowing. Two cars nearly sideswiped me, and one big-ass truck stopped so suddenly in front of me that I had all I could do to swerve out of crashing into it and becoming an instant Long Island Expressway pancake.

Let's say the QM time-travel people



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

were right. Particles are able to influence each other traveling away from each other at huge distances, because they're actually traveling back in time to an earlier position when they were in immediate physical contact. So time travel on the quantum mechanical level is possible—technically.

But let's say Hawking was also right. The Universe can't allow time travel—for to do so would unravel its very being. So it protects itself from dissemination of information backwards in time.

That wouldn't be so crazy. People are saying the Universe can be considered one huge organism—a Gaia writ large. Makes sense then, that this organism, like all other organisms, would have tendencies to act on behalf of its own survival—would act to prevent its dissolution via time travel.

But how would such protection express itself? A physicist figures out a way of creating a local wormhole that can send some information back in time—back to his earlier self and equipment—in some non-blatantly paradoxical way. It doesn't shut off the circuit that sent it. So this information is in fact sent and in fact received—by the scientist. But the Universe can't allow that information transfer to stand. So what happens?

Hawking says the Universe's first line of defense is to create energy disturbances severe enough at the mouths of the wormhole to destroy it and its time-channelling ability. OK. But let's say the physicist is smart or lucky enough to create a wormhole that can withstand these self-disruptive forces? What does the Universe do then?

Maybe it makes the scientist forget this information. Maybe causes a minor stroke in the scientist's brain. Maybe causes the equipment to irreparably break down. Maybe the lucky physicist is really unlucky. Maybe this already happened lots of times.

But what happens when a group of scientists around the world who achieve this time travel transfer reach a critical mass—a mass that will soon publish its findings, and make them known, irrevocably, to the world?

Jeez!—I jammed the heel of my hand into my car horn and swerved. The damn Volkswagen driver must be drunk out of his mind—

So what happens when this group of scientists gets information from its own future? Has proof of time travel, information that can't be? The Universe regulates itself, polices its timeline, in a more drastic way. All existence is equilibrium—a stronger threat to existence evokes a stronger reaction. A freak fatal accident. A sudden massive heart attack. Another no-motive, drive-by shooting that the Universe already dishes out to all too many people in this hapless world of ours. Except in this case, the Universe's motive is quite clear and strong: it must protect its chronology, conserve its current existence.

Maybe this already happened too. How many physicists on the cutting edges of this science died too young in recent years? Jeez, here was a story for Jack all right.

But why Lauren? Why did she have to die?

Maybe because the Universe's pro-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tection level went beyond just those who received illicit future information. Maybe it extended to those who understood just what it was doing, just—

Whamp! Something big had smashed into the rear of my car, and I was skidding way out of control towards the edge of the Throgs Neck Bridge, towards where some workers had removed the barriers to fix some corrosion or something. I was strangely calm, above it all. I told myself to go easy on the brakes, but my leg clamped down anyway and my speed increased. I wrenched my wheel around, but all that did was spin me into a backward skid off the bridge. My car sailed way the hell out over the black-and-blue Long Island Sound.

The way down took a long time. They'd say I was overwrought, overtired, that I lost control. But I knew the truth, knew exactly why this was happening. I knew too much, just like Lauren.

Or maybe there was a way out, a weird little corner of my brain piped up.

Maybe I didn't know the truth. Maybe I was wrong.

Maybe if I could convince myself of that, the Universe wouldn't have to protect itself from me. Maybe it would give me a second chance.

My car hit the water.

I was still alive.

I was a pretty fair swimmer.

If only I could force myself never to think of certain things, maybe I had a shot.

Maybe the deaths of the physicists were coincidental after all. . . .

I lost consciousness thinking no, I couldn't just forget what I already knew so well. . . . How could I will myself not to think of that very thing I was trying to will myself not to think about . . . that blared in my mind now like a broken car horn. . . . But if I died, what I knew wouldn't matter anymore. . . .

I awoke fighting sheets . . . of water. No, these were too white. Maybe hospital sheets. Yeah, white hospital sheets. They smelled like that too.

I opened my eyes. Hospital rooms were hell—I knew better than most the truth of that—but this was just a hospital room. I was sure of that. I was alive.

And I remembered everything. With a spasm that both energized and frightened me, I realized that I recalled everything I'd been thinking about the Universe and its protective clutch. . . .

But I was still alive.

So maybe my reasoning was not completely right.

"Dr. D'Amato," a female voice, soft but very much in command, said to me. "Good to see you awake."

"Good to *be* awake, Nurse, ah, Johnson." I squinted at her name tag, then her face. "Uhm, what's my situation? How long have I been here?"

She looked at the chart next to my bed. "Just a day and a half," she said. "They fished you out of the Sound. You were suffering from shock. Here," she gave me a cup of water. "Now that you're awake, you can take these orally." She gave me three pills,



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

and turned off the intravenous that I'd just realized was attached to me. She disconnected the tubing from my vein.

I held the pills in my hand. I thought about the Universe again. I envisioned it, rightly or wrongly, as a personal antagonist now. Let's say I was right about the reach of its chronology protection after all? Let's say it had spared me in the water, because I was on the verge of willing myself to forget? Let's say it had allowed me to get medicine and nutrition intravenously, while I was unconscious, because while I was unconscious I posed no threat? But let's say now that I was awake, and remembered, it would—

"Dr. D'Amato. Are you falling back asleep on me?" She smiled. "Come on now, be a good boy and take your pills."

They burned in my palm. Maybe they were poison. Maybe something I had a lethal allergy to. Like Lauren. "No," I said. "I'm OK, now, really. I don't need them." I put the pills on the table, and swung my legs out of bed.

"I don't believe this," Johnson said. "It's true—you doctors make the worst god-awful patients. You just stay put now—hear me?" She gave me a look of exasperation and stalked out the door, likely to get the resident on duty, or, who knew, security.

I looked around for my clothes. They were on a chair, a dried out crumpled mess. They stank of oil and saltwater. At least my wallet was still inside my jacket pocket, money damp but intact. Good to see there was still some honesty left in this town.

I dressed quickly and opened the door. The corridor was clear. Goddamn it, I could leave if I wanted to. I was a patient, not a prisoner.

At least insofar as the hospital was concerned. As for the larger realm of being, I couldn't say any more.

I took a cab straight home.

The most important new piece of evidence—to this whole case, as well as to me personally—was that I was alive. This meant that my assessment of the Universe's vindictiveness was missing something. Or maybe the Universe was just a less effective assassin of forensic scientists than quantum physicists and their knowing wives.

I called Jack to see if there was anything new.

"Oh, just a second please," the *Newsday* receptionist said. I didn't like the tone of her voice.

"Hello, can I help you?" This was a man's voice, but not Jack's. He sounded familiar but I couldn't place him.

"Yes, I'm Dr. Phil D'Amato of NYPD Forensics calling Jack Donovan."

Silence. Then, "Hello, Phil. I'm Sam Abrahmson. You still in the hospital?"

Right. Abrahmson. That was the voice. "No. I'm out. Where's Jack?"

Abrahmson cleared his throat. "He was killed with Dave Strauss this morning. He'd talked Strauss into going public with this, Strauss supported your story. He'd picked Strauss up at his summer cottage in Ellenville—Strauss had been hiding out there—and was driving him back to



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the city. They got blown off a small bridge. Freak accident."

"No freakin' accident," I said. "You know that as well as I do." Another particle who'd danced this sick quantum twist with me. Another particle dead. But this one was completely my fault—I'd brought Jack into this.

"I don't know what I know," Abrahmson said. "Except that at this point the story's on hold. Until we find out more."

I was glad to hear he sounded scared. "That's a good idea," I said. "I'll be back to you."

"Take care of yourself," Abrahmson said. "God knows what that subatomic radiation can do to the body and mind. Or maybe it's all just coincidence. God only knows. Take care of yourself."

"Right." Subatomic radiation. Abrahmson's latest culprit. First it was a virus, now it was radiation. I'd said the same stupid thing to Lauren, hadn't I? People like to latch on to something they know when faced with something they don't know—especially something that kills some physicists here, a reporter there, who knew who else? But radiation had nothing to do with this. Stopping it would take a lot more than lead shields.

I tracked down Richard Hays. I was beginning to get a further inkling of what might be going on, and I needed to talk it out with one of the principals. One of the last remaining principals. It could save both our lives.

I used my NYPD clout to intimidate enough secretaries and assistants to get directly through to him.

"Look, I don't care if you're the bleeding head of the FBI," he said. He was British. "I'm going to talk to you about this just once, now, and then never again."

"Thank you, Doctor. So please tell me what you think is happening here. Then I'll tell you what I know, or think I know."

"What's happening is this," Hays said. "I was working on a project with my colleagues. That's true. But I came to realize the project was a dead-end—that the phenomena we were investigating weren't real. So I ceased my involvement in that research. I have no intention of ever picking up that research again—of ever publishing about it, or even talking about it, except to indicate that it was a waste of time. I'd strongly advise you to do the same."

I had no idea how he talked ordinarily, but his words on the phone sounded like each had been chosen with the utmost care. "Why do I feel like you're reading from a script, Dr. Hays?"

"I assure you everything I'm saying is real. As you no doubt already have evidence of yourself," Hays said.

"Now you look," I raised my voice. "You can't just sweep this under the rug. If the Universe *is* at work here in some way, you think you can just avoid it by pretending you don't know about it? The Universe would know about your pretense too—it's after all still part of the Universe. And word of this will get out anyway—someone will sooner or later publish something. If you want to



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

live, you've got to face this, find out what's really happening here, and—"

"I believe you are seriously mistaken, my friend. And that, I'm afraid, concludes our interview, now and forever." He hung up.

I held on to the disconnected phone, which beeped like a seal, for a long time. I realized that the left side of my body hurt, from my chest up through my shoulder and down my arm. The pain had come on, I thought, at the end of my futile lecture to Hays. Right when I'd talked about publishing. Maybe publishing was the key—maybe talk about dissemination of this information, as opposed to just thinking about it, is what triggered the Universe's backlash. But I was also sure I was right in what I'd said to Hays about the need to confront this, about not running away. . . .

I put the phone back in its receiver and lay down. I was bone tired. Maybe I was getting a heart attack, maybe I wasn't. Maybe I was still in shock from my dip in the Sound. I couldn't fight this all on my own much longer.

The phone rang. I fumbled with the receiver. How long had I been sleeping? "Hello?"

"Dr. D'Amato?" a female voice, maybe Lauren's, maybe Nurse Johnson's. No, someone else.

"Yes?"

"I'm Jennifer Fenwick."

Fenwick, Fenwick—yes, Jennifer Fenwick, the last quantum physicist on this project. I'd wheedled her number from Abrahmson's secretary and left a message for her in Australia—the girl at the hotel wasn't sure if she'd already left. "Dr. Fenwick, I'm glad you called. I, uhm, had some ideas I wanted to talk to you about—regarding the quantum signaling project." I wasn't sure how much she knew, and didn't want to scare her off.

She laughed, oddly. "Well, I'm wide open for ideas. I'll take help wherever I can get it. I'm the only damn person left alive from our research group."

"Only person?" So she knew—apparently more than I.

I looked at the clock. It was tomorrow morning already—I'd slept right through the afternoon and night. Good thing I'd called my office and gotten the week off, the absurd part of me that kept track of such trivia noted.

"Richard Hays committed suicide last night," Fenwick's voice cracked. "He left a note saying he couldn't pull it off any longer—couldn't surmount the paradox of deliberately not thinking of something—couldn't overcome his lifelong urge as a scientist to tell the world what he'd discovered. He'd prepared a paper for publication—begged his wife to have it published posthumously if he didn't make it. I spoke to her this morning. I told her to destroy it. And the note too. Fortunately for her, she had no idea what the paper was about. She's a simple woman—Richard didn't marry her for her brains."

"I see," I said slowly. "Where are you now?"

"I'm in New York," she said. "I wanted to come home—I didn't want



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

to die in Australia."

"Look, you're still alive," I said. "That means you've still got a chance. How about meeting me for lunch"—I looked at the clock again—"in about an hour. The Trattoria Il Bambino on 12th Street in the Village is good. As far as I know, no one there has died from the food as yet." How I could bring myself to make a crack like that at a time like this, I didn't know.

"OK," Fenwick said.

She was waiting for me when I arrived. On the way down, I'd fantasized that she'd look just like Lauren. But in fact she looked a little older and wiser. And even more frightened.

"All right," I said after we'd ordered and gotten rid of the waiter. "Here's what I have in mind. You tell me as a physicist where this might not add up. First, everyone who's attempted to publish something about your work has died."

Jennifer nodded. "I spoke to Lauren Goldring the afternoon she died. She told me she was going to the press."

I sighed. "I didn't know that—but it supports my point. In fact, the two times I even toyed with going public about this, I had fleeting interviews with death. The first time in the water, the second with some sort of pre-heart attack, I'm sure."

Jennifer nodded again. "Same for me. Wheeler wrote about cosmic censorship. Maybe he was on to the same thing as Hawking."

"All right, so what does that tell us?" I said. "Even thinking about publishing this is dangerous. But apparently it's not a capital offense—knowing about this is in itself not fatal. We're still alive. It's as if the Universe allows private, crackpot knowledge in this area—'cause no one takes crackpots seriously, even scientific ones. It's the danger of public dissemination that draws the response—the threat of an objectively accepted scientific theory. Our private knowledge isn't the real problem here. Communication is. The definite intention to publish. That's what kills you. Yeah, cosmic censorship is a good way of putting it."

"OK," Jennifer said.

"OK," I said. "But it's also clear that we can't just ignore this—can't expect to suppress it in our minds. Not having any particular plan to publish won't be enough to save us—not in the long run. Sooner or later after a dark silent night we'd get the urge to shout it out. It's human nature. It's inside of us. Hays's suicide proves it—his note spells it out. You can't just not think of something. You can't just will an idea into oblivion. It's self-defeating. It makes you want to get up on the rooftop and scream it to the world even more—like a repressed love."

"Agreed," Jennifer said. "So what do we do, then?"

"Well, we can't go public with this story, and we can't will ourselves to forget it. But maybe there's a third way. Here's what I was thinking. I can tell you—in strict confidence—that we sometimes do this in forensics." I lowered my voice. "Let's say we have someone who was killed in a certain way, but we don't want the murderer to know that we know how the mur-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

der took place. We just deliberately at first publicly interpret the evidence in a different way—after all, there's usually more than one trauma that can result in a given fatal injury to a body—more than one plausible explanation of how someone was killed. Slipped and hit your head on a rock, or someone hit you on the head with a rock—sometimes there's not much difference between the results of the two."

"The Universe is murderous; all right, I can see that, but I don't see how what you're saying would work in our situation," Jennifer said.

"Well, you tell me," I said. "Your group thinks it built a wormhole that allows signaling through time. But couldn't you find another phenomenon to attribute those effects to? After all, we only have time travel on the brain because of H. G. Wells and his literary offspring. Let's say Wells had never written *The Time Machine*? Let's say science fiction had taken a different turn? Then your group would likely have come up with another explanation for your findings. And you can do this now anyway!" I took a sip of wine and realized I felt pretty good. "You can publish an article on your work, and attribute your findings to something other than time travel. Indicate they're some sort of other physical effect. Come up with the equivalent of a false phlogiston theory, an attractive bogus conception for this tiny sliver of subatomic phenomena, to account for the time travel effects. The truth is, few if any serious scientists actually believe that time travel is possible anyway, right? Most think it's just science fiction, nothing else. Who would have reason to suspect a time travel effect here unless you specifically called attention to it?"

Jennifer considered. "The graduate research assistants worked only on the data acquisition level. Only the project principals, the seven of us," she caught her breath, winced—"only the seven of us knew this was about time travel. No one else. Ours were supposedly the best minds in this area. Lot of good it did us."

"I know," I tried to be as reassuring as I could. "But then without that time travel label, all you've got is another of a hundred little experiments in this area per year—jeez, I checked the literature, there are a lot more than that—and your study would likely get lost in the wash. That should shut the Universe up. That should keep it safe from time travel—send the scientific community off on the wrong track, in a different direction—maybe not send them off in any direction at all. Could you do that?"

Jennifer sipped her wine slowly. Her glass was shaking. Her lips clung to the rim. She was no doubt thinking that her life depended on what she decided to do now. She was probably right. Mine too.

"Exotic matter is what makes the effect possible," she said at last. "Exotic matter keeps the wormhole open long enough. No one knows much about how it works—in fact, as far as I know, our group created this kind of exotic matter, in which weak forces are suspended, for the first time in our project. I guess I could make a case that a peculiar property of this exotic matter is that it creates effects that mimic time travel in artificial wormholes—I could



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

make a persuasive argument that we didn't really see time travel through that wormhole at all, what we have instead is a reversal of processes to earlier stages when they come in contact with our exotic matter, no signaling from the future. You know—we thought the glass was half full, but it was really half empty."

"No," I said. "That's still not going far enough. You've got to be more daring in your deception—come up with something that doesn't invoke time travel at all, even in the negative. Publishing a paper with results that are explicitly said not to demonstrate time travel is akin to someone the police never heard of coming into the station and saying he didn't do it—that only arouses our suspicion. I'm sorry to be so blunt, Jennifer. But you've got to do more. Can't you come up with some effects of exotic matter that have nothing to do with time travel at all?"

She drained her wine glass and put it down, neither half full nor half empty. Completely empty. "This goes against everything in my life and training as a scientist," she said. "I'm supposed to pursue the truth, wherever it takes me."

"Right," I said. "And how much truth will you be able to pursue when you're like Hays and Strauss and the others?"

"Einstein said the Universe wasn't malicious," she said. "This is unbelievable."

"Maybe Einstein was saying the glass was half empty when he knew it was half full. Maybe he knew just what he was doing—knew which side his bread was buttered—maybe he wanted to live past middle age."

"God Almighty!" She slammed her hand on the table. Glasses rattled. "Couldn't I just swear before you and the Universe never to publish anything about this? Wouldn't that be enough?"

"Maybe, maybe not," I said. "From the Universe's point of view, your publishing a paper that explicitly attributes the effects to something other than time travel seems much safer—to you as well as the Universe. Let's say you change your mind, years from now, and try to publish a paper that says you succeeded with time travel after all. You'd already be on record in the literature as attributing those effects to something else—you'd be much less likely to be believed then. Safer for the Universe. Safer for you. A paper with a false lead is not only our best bet now, it's an insurance policy for our future."

Jennifer nodded, very slowly. "I guess I could come up with something—some phenomenon unrelated to time travel—unsuggestive of it. The connection of quantum effects to human thought has always had great appeal, and even though I personally never saw much more than wishful thinking in that direction."

"That's better," I said quietly.

"But how can we be sure no one else will want to look into these effects?" Jennifer asked.

I shrugged. "Guarantees of anything are beyond us in this situation. The best we can hope for are probabilities—that's how the QM realm operates anyway, isn't it—likelihoods of our success, statistics in favor of our survival. As for your effects, well, effects don't have much impact outside



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

of a supportive context of theory. Psalm 51 says 'Cleanse me with hyssop and I shall be clean'—the penicillin mold was first identified on a piece of decayed hyssop by a Swedish chemist—but none of this led to antibiotics until spores from a mold landed in Fleming's petrie dish, and he placed them in the right scientific perspective. Scientists thought they had evidence of spontaneous generation of maggots in old meat, until they learned how maggots make love. Astronomers saw lots of evidence for a luminiferous ether, until Michelson-Morley decisively proved that wrong. You're working on the cutting edge of physics with your wormholes. No one knows what to expect—you said it yourself—yours were the best minds in this area. *You* can create the context. No one's left to contradict you. Let's face it, if you word your paper properly, it will likely go unnoticed. But if not, it will point people in the wrong direction—and once pointed that way, away from time travel, the world could take years, decades, longer, to look at time travel as a real scientific possibility again. The history of science is filled with wrong glittering paths, tenaciously taken and defended. That's the path of life for us. I'm not happy about it, but there it is."

Our food arrived. Jennifer looked away from me, and down at her veal.

I hadn't completely won her over yet. But she'd stopped objecting. I understood how she felt. To theoretical scientists, pursuit of truth was sometimes more important than life itself. Maybe that's why I went into flesh-and-blood forensics. I pushed on. "The truth is, we've all been getting along quite well without time travel anyway—it could wreak far more havoc in everyone's lives than nuclear weapons ever did. The Universe may not be wrong here."

She looked up at me.

"It's all up to you now," I said. "I'm not a physicist. I can't pull this off. I can take care of the general media, but not the scientific journals." I thought about Abrahmson at *Newsday*. He hadn't a clue which way was up in this thing. He'd just as soon believe this nightmare was all coincidence—the ever popular placeholder for things people didn't want to understand. I could easily pitch it to him in that way.

She gave me a weak smile. "OK, I'll try it. I'll write the article with the mental spin on the exotic effects. *Physics Review D* was given some general info that we were doing something on exotic matter, and is waiting for our report. It'll have maximum impact on other physicists there. The human mind in control of matter will be catnip for a lot of them anyway."

"Good," I smiled back. I knew she meant it. I knew because I suddenly felt very hungry, and dug into my own veal with a zest I hadn't felt for anything in a while. It tasted great.

Two particles of humanity had connected again. Maybe this time the relationship would go somewhere.

It occurred to me, as I took Jennifer's hand and squeezed it with relief, that maybe this was just what the Universe had wanted all along.

As they say in the Department, an ongoing string of deaths is a poor way to keep a secret. ■

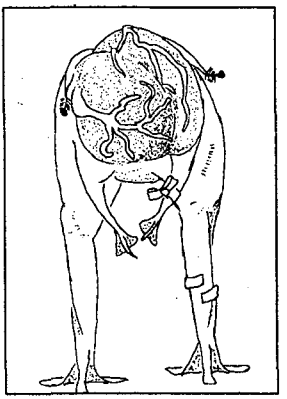


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# From The Travel Diary of Braxton Montague Shew IV

Mother darling:

I have spent a deliciously dangerous evening among the headwalkers of Dholdon Town, on Prince Whistler's World in the Horsehead Sector. The area has an unsavory reputation, well-deserved I am sure, and I would not have gone save for the insistence of Roberta, who joined our cruise ship at Port Dtchiteh during our last port of call. She insisted on going, and would have gone alone—so naturally—what could I do but stand protector? [No, mater, there is nothing serious between us. We have not even discussed genomes, let alone drawn lab samples.]



A Headwalker fron Dholdon Town

I have enclosed a sketch of a well-known Dholdon "Character," Baddadi Raibrahn, who holds the position of "bpadst"-man in Dholdon Town. He is described by his confréres as "minnerennazh ungkyar dtogk," and is said to "shpihdinna dawin" and "pbuhlonsu perminskép." Great feats, I am sure, but none of these native phrases, to my knowledge, translates into Anglo-Terran.

Speaking of great feats, the headwalkers hold all the sector's Olympic championships from the 50-kletch dash to the grueling 200-freem marathon. Their favorite Terran sport is soccer. However, they have been barred from competing in the Home Sector, which gives them nothing to kick about. Roberta and I had hoped to catch a performance of the renowned Redyosit I-haw Rogkedts troupe, but, alas, the show has been canceled; and so we made our way back to Port Dholdon, again amazed at how little Terran culture has permeated the back clusters.

As always,
your loving son,
Brax

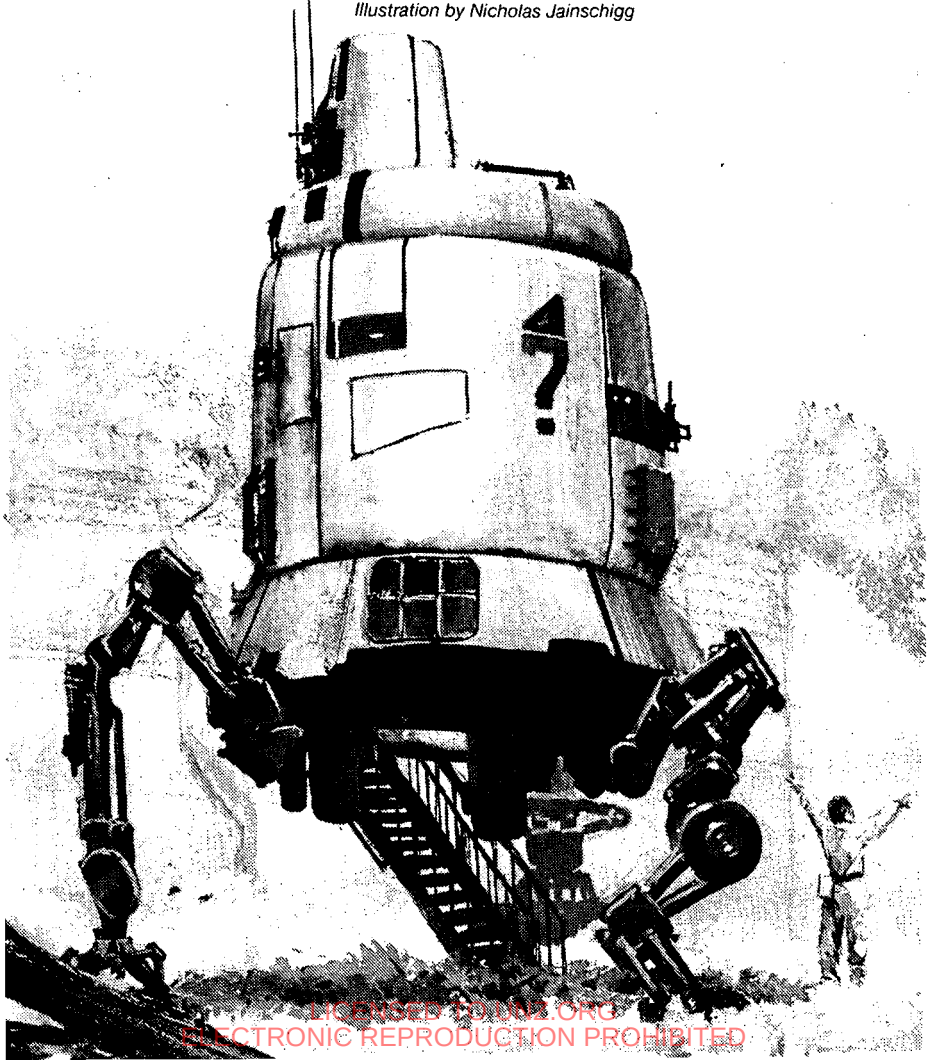
LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Maya Kaathryn Bohnhoff

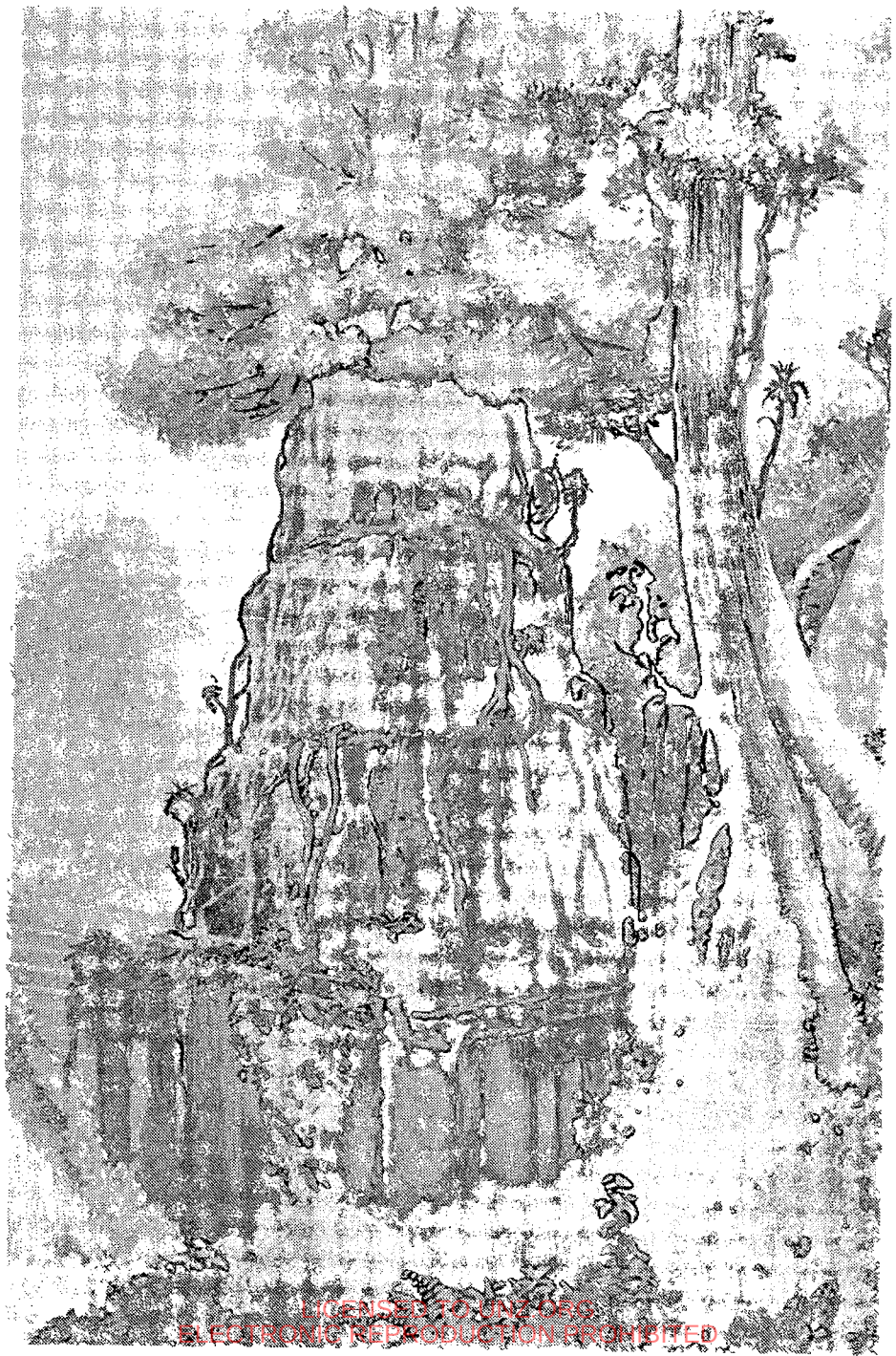
# THE SECRET LIFE OF GODS

*It's not easy working from fragmentary evidence. . . .*

*Illustration by Nicholas Jainschigg*



LICENSED TO NIZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



LICENSED TO JIN YOO
ELECTRONIC REPRODUCTION PROHIBITED

"I'm telling you, this is the opportunity of a lifetime. Not only is this one of the most exciting archaeological finds since . . . since . . ." Rhys Llewellyn's hands searched the air for a suitable comparison.

Danetta Price, CEO of Tanaka Enterprises, settled in her chair and propped sneakered feet atop the coffee table in the small lounge/mess of Rhys's corporate schooner, *Ceilidh*. She was wise enough not to try to finish the sentence. That would be sure to send him off into a litany on the accuracies and inaccuracies of her choice. "I get the picture," she told him dryly. "Now, would you kindly stop pacing and tell me—"

But he'd gotten himself unstuck and was off again. "And of course, to work with Dr. Burton . . . I did tell you I studied under him at Edinburgh?" Seeing her nod, he forged on. "I was in awe of the man, Danetta. Sheerly and purely in awe of him. He's been more influential in my life as an archaeologist—"

"I *hear* you, Rhys!" Danetta chuckled and peered at her chief negotiator between the toes of her sneakers. "How long do you think you'll be gone?"

Rhys ran a hand through his unruly red hair and grinned ruefully. "Sorry. I'm not sure how long I'll be gone precisely—" Reading her frown, he added, "But no more than a month or two at best."

"At *worst* you mean."

"I have the time coming."

Danetta raised a restraining hand. "I know. You have months of leave coming. I'm only selfishly concerned with the state of our negotiating team without you and yours on it. I don't suppose you intend to leave Yoshi and Rick out of this little junket."

Rhys scratched behind his ear, a gesture Danetta knew meant he thought he was asking for the Moon. "Well, actually, I thought they'd enjoy the break. It's been a while since any of us has worked in the field. Not that I'm belittling your efforts to keep us in trim. That conference on xenoanthropology last month was marvelous. But we all miss the field work—and this, well—"

"Yes, I know—once in a lifetime opportunity, greatest dig since King Tut, close company with the God of Archaeology."

Rhys flushed. "Please, Danetta, I don't worship the man, but I've the deepest respect for his accomplishments. And I said not one word about 'King Tut,' which, as you ought to know, was a find of very little historical significance—"

"OK, OK. *Saint* Burton, then, and you can pick your own dig." Danetta uncrossed her legs and stood, straightening bright silk shorts around her hips. "As if I'd ever say 'no' to you, Rhys McCrae Llewellyn. Go on your little sabbatical, with my blessing. We don't have any major bids in the offing that our regular crew can't handle. If Yosh and Rick want to tag along, they're certainly entitled. They've got as big a backlog of leave as you have. It's not *my* idea of a dream vacation, but, to each his own. Now . . ." she glanced purposefully at the door to the companion-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

way. "If you don't think me rude, I'll just take my little cutter and shift on back to the home world, "It's been about two months since I've seen my beloved husband. And the changes on Tson are happening just about as fast as he can handle them." She circled the table, caught Rhys by the upper arms and gave him a solid kiss on the cheek. "Bon voyage, Professor. Have a nice dig."

Rhys waited a restrained five seconds after the lounge doors closed before executing a four-foot-high pirouette and a clan McCrae war whoop. He'd landed and was going up for a second revolution when Yoshi Umeki poked her head into the room from the adjoining galley. "Sir? Are you all right?"

He caught himself on the back of a chair, narrowly avoiding a trip to the floor, and straightened his flight suit. "Are you all right, *Rhys,*" he corrected.

Her smile was brief and bright. "Are you all right, Rhys?"

"I'm fine, thank you." He rubbed his hands together briskly, a gesture which Yoshi knew was usually followed by some outrageous suggestion. "How would you like to go on a little vacation?"

The "little vacation" began with the passengers and crew of the *Ceilidh* in an induced sleep, preparatory to a shift to the distant precincts of a star its human visitors called Leguin. They would travel simultaneously through space and time—outward through one, backward and forward through the other—to arrive at their destination within a week of when they had left their point of origin. The week of travel time was composed entirely of inter-shift stops to reorient the ship for its next jump and check the health of its passengers; the temporal shift itself was virtually instantaneous. Backward and forward went the *Ceilidh*, safeguards built into her temporal grid dictating that she ascended through time exactly as far as she had descended. Rhys, as always, slid toward sleep imagining what it would be like if they were only allowed to take a detour now and then.

A week later, the Tanaka Corporate schooner *Ceilidh* slipped out of time-altered space, settled into synchronous orbit around Leguin 4, and delivered its passengers into what a groggy Roderick Halfax immediately dubbed "Fort Stinking Swamp." It wasn't so much a swamp as it was a rain forest, Rhys told him—as if he didn't already know the difference—nor did it stink, strictly speaking. The equatorial forest on Leguin 4 was a place of pungent and warring perfumes, rather like, Yoshi commented, what happened when all the Umeki and Sakai aunts gathered for tea on a muggy Hagi day. Rhys had to admit the cloyingly sweet smell of blooms might grow tiresome. He said that, then forgot the blooms and their odiferous presence the moment he set eyes on Professor Sir Drew Burton, K.N.B.E., and his mammoth find.

It was a complex of buildings still half-buried in green and burgundy plant life that brought to mind Angkor Wat, Teotihuacan, and the ziggurats of Baroosh at Wan, all at the same mo-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ment. Walls of massive granitic block rose from a froth of shrub and vine to a height of about five meters. They were interrupted by a rectangular gateway that extended another two meters above that. The lintel evidently held something of interest, for a scaffold covered it from edge to edge. Above that rise of native rock Rhys could see the top of a thick spire whose rounded sides were cloaked in mosses of varying hues. So overwhelmed was he by the sheer magnitude of the place, he barely noticed that the patron saint of archaeology was vigorously pumping his hand.

"Professor Llewellyn," the older man enthused, "you have no idea how pleased I am that you and your associates could join us here. You've done well since leaving University, sir. Your reputation precedes you."

Rhys caught himself back from the dizzying sight of the tower looming above its encircling walls, swatted an insect and murmured, "Sir, your reputation *overwhelms* me."

Burton laughed, showing pleasant crow's feet and gleaming, even teeth. "Flattery will get you anywhere. You know, I have to admit, I was dubious when I heard you'd gone into corporate service. A little disappointed, if you want the honest truth. But it didn't seem to slow you down in the 'real' world, eh? You practically wrote the book on alien antiquities."

Rhys flushed pleasantly. "Correction. I wrote *one* book on xenoarchaeology; you've written dozens on every conceivable subject."

"Twenty . . . but really, I thought your analysis of the Poclar culture on New Scotland was quite insightful. I'll be interested to see what you think of our work here."

They were moving now, beneath the great stone arch and into the embrace of the ruins. Rick Halfax, falling in beside Yoshi, caught her eye and made a face. "Look at 'em, Yosh. Two peas in a pod and happy as clams. I think the professor has found a soul mate."

Yoshi, to whom colloquial English was a third language at best, and who had always thought of *herself* as Rhys Llewellyn's soul mate, gave her companion a wrinkle-browed look of puzzlement. "Isn't that a mixed metaphor?"

"They're not metaphors; they're clichés. Mixed? I dunno. I'd eat peas with clam."

"Well, I've never understood that saying. How can you tell a clam is happy?"

Rick rolled his eyes. "Never mind."

Yoshi shrugged and lengthened her strides so she could hear what the professors clam were discussing.

"The Leguini are rather an odd bunch of philistines," Dr. Burton was saying as he led the way among the lichen-encrusted buildings. "They don't seem to care two figs for their distant past. Anything over 500 years old is completely uninteresting to them. Scott—that's our master digger—insists that's pragmatism. I personally think it's laziness. I suppose I ought to consider us fortunate; if they weren't so 'pragmatic' the Leguini would probably be out here making our lives hell."

Yoshi doubted Rhys even heard



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

him. He was turning in a slow, unsteady circle, an expression of complete rapture on his face, his eyes drinking in the ruins that now surrounded them. The tower was the most outstanding feature in the group. It sat at the locus of the cluster of buildings, its spiral rising, vine-draped and majestic, out of a hill of detritus which was still being cleared away by a team of grimy diggers. Though the top several tiers had crumbled, it stood high above the surrounding walls, a veil of steamy mist cloaking its highest levels. A huge tree had grown up right through the middle of it, and spread its branches out over the mountain of masonry like a fantastic parasol. To Yoshi it looked like a many-tiered cake with green and burgundy icing and a giant florette ornament. She grimaced at the lack of professionalism in that comparison—her anthropology professor father would despair of her.

Flanking the tower on either side were two low, massive structures —two, maybe three stories tall. They were windowless, but had several huge doors apiece set at regular intervals along the facades. They appeared to be identical. A glance back toward the gate showed the one apparent difference; the building to the east had a square annex at its northern end that had tall, rectangular windows and a door of normal proportions. Only now did Yoshi notice the accouterments of archaeology—the ranging pegs, the spades, the finds trays and canisters that she suspected would always clutter a dig no matter how much technology evolved.

"This is incredible!" Rhys's voice oozed out in hushed awe.

Burton was nodding, smiling. "Isn't it, though? Reminds one a bit of Caracol. Except, of course, for the burgundy foliage. We call it Sper-ets —that's Temple of the Moon, in the local parlance."

They took a whirlwind tour of the major features of Sper-ets—whirlwind, because Leguin was sinking toward the horizon of its fourth planet, and night, according to their host, was not a safe time to be poking about among the stones.

"Nocturnal nasties," he explained. "Leguin 4 is home to a lovely assortment of poisonous creepy-crawlies. An entomologist's paradise."

"So, everything just closes up around here at night?" Rick asked.

"Around here, yes. Rural Leguini wear 'night suits'—hip-waders made of some tough but flexible synthetic; a cowling that reaches almost to the waist. Of course, we've taken the precaution of connecting all the tents and cabins in our camp complex with slatex tubing." He glanced at Rhys. "I hear you're partially responsible for the increased availability of that commodity."

Rhys smiled, pleased that Burton knew of his previous year's coup in the slatex market. His pleasure was immediately dampened by the regret that the coup hadn't been archaeological instead of commercial. "I don't suppose you've heard of the recent developments on Tson?" he asked hopefully.

"No, sorry, I haven't. But you can catch me up over supper."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

They dined in the camp commons, a large portable cabin that would, Dr. Burton assured them, be proof to the local fauna. There they sat at a table with Burton's associate, Nyami Deer-Walks-Here; his dig master, Scott Buchanan; his apprentice, Wayne Bell; and a Xthni named Tzia of Qltrel, a specialist in restoration who also served as finds assistant. There were others, as well, diggers and apprentices (mostly students from Collective universities), scientific specialists from a variety of disciplines. But Sir Drew Burton was undisputedly the crowned head of the gathering, and Rhys felt rather like the starry-eyed traveler who finds himself assigned to the captain's table for a galactic cruise.

The only sour note of the evening played when Yoshi stopped Wayne Bell in the middle of a joke to say, "I notice you keep referring to the aboriginal population as the 'Linguine.' Why is that?"

Bell shrugged and smiled, eyes kindling in a manner that made Rhys suspect Yoshi was the only person at table he'd not resent for interrupting a punch line. "Leguini—linguine. You can see how it sort of lends itself to the word play."

Yoshi, missing both the humor and the humorist's intent expression, shook her head. "Leguin is what *we* called the star before we realized there was anybody here. They call it Etsa, which means 'light-giver.' And they call their planet Etsat, meaning 'child of Etsa,' and themselves Etsatat, 'meaning children of the child of Etsa.' "

Bell's brows raised. "You've certainly done your homework."

Yoshi toyed with her braid. "I find the Etsatat culture interesting. It has striking parallels to nineteenth century Earth. Of course, on Etsat, there are no significant subcultures to compare with Earth's aboriginal groups. In some ways that makes it all the more fascinating. A singularly unfragmented global society."

"Yes, well, I fail to find them the least bit engaging," interjected Burton. "They've lost touch with their past. So much so that they're absolutely useless as guides. They've no knowledge of the way their ancestors lived, how they thought, what they loved." He shook his head, obviously finding that a difficult thing to grasp.

Nyami Deer-Walks-Here nodded in agreement. "Drew's right. The Etsatat are a singularly future-oriented people. What's past is past, what's buried might as well stay that way. I have to admit, I found that very disconcerting when we first arrived." She chuckled. "When we told the regional governor what we wanted to do out here in the wildy woods, he thought we were insane. Just a bunch of rusticating lovers of antiquity, eh, Drew? I sometimes think we'd be content to live life backwards."

Burton harrumphed. "Well, there's to be a balance, I'm sure, but dammit, Nyami, these people have been so bloody unhelpful. Can't tell us anything, because they've never bothered to explore." He leaned toward Rhys across the table. "Do you know, we've never found the slightest evi-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

dence of latter-day looting? No one has been in these buildings since they were abandoned."

"Except for the vermin," amended Bell.

"Except for that. And this is by no means the only site we've been working. There's a village about five klicks from here, and temple complexes like this one—" He thumbed toward the dig, "—are all over the map. But the Leguini have absolutely no record of any of them." His eyes wandered to the dark outside the cabin windows—a dark lit by plasma torches on tall poles. "The treasures that have lain buried here for countless centuries . . . ."

"Are still here for you to find," Rhys finished, grinning.

Burton returned the grin. "You count my blessings for me. And tomorrow, you'll get to join in the finding. Now, before we all turn in, I want to give you a preview of what's in store for you." He rose from the table and disappeared into the connecting tube that led to the Finds tent. When he reappeared two minutes later, he carried a wrapped object in his hands. Setting it on the table, he carefully peeled away the soft swaddling. Inside was a statuette approximately thirty centimeters in height.

That the person portrayed was Etsatat was obvious, though the statue was somewhat stylized. Vaguely humanoid, it had the characteristic wide face with the tiny, pointed chin, low set, over-sized eyes and wide thin-lipped mouth. One long-fingered hand clutched a staff of some dull metal, the other was raised to a necklace of large rectangular bangles that hung around the effigy's neck. Atop the staff was a vaguely crescent- or fan-shaped cap. Whether it was a scepter or weapon wasn't readily apparent. The Etsatat's oddly jointed legs seemed to be encased in boots of a different material than the body and, on second glance, Rhys realized the hands and forearms were also sheathed in the same stuff. A long, flat apron hung from beneath the necklace and seemed, on closer inspection, to be part of a stole that covered the figure's shoulders completely. Taken all together it looked to be protective gear—armor perhaps, or protection from Etsat's "nocturnal nasties," or yet again, ceremonial garb or uniform.

By far the most outstanding bit of apparel was the figure's elaborate headdress. Fitted to the wide, shallow skull, was a helmet of the same metal as the staff. Atop it was a flat, gleaming silver crest that was a larger twin of the one mounted atop the staff. It reminded Rhys much of a figure found on Earth at Teotihuacan in the late twentieth century.

"Meet the Moon God, whose temple this appears to be. We call him Etseket, which is Etsatat for Moon God, naturally. As you can see, he's a warrior deity of some sort. Or the priest-surrogate for same. We haven't found out quite as much about him as we'd like, but this entire complex, as I said, appears to be dedicated to him. We're not quite certain of the purpose of the buildings on site—although they seem to be depositories for treasure, tribute, perhaps burial goods. The



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tower . . . well, there's a mystery. The hole in the roof is the only obvious access point—though that giant conifer's clogged that up pretty effectively. We're fairly certain there's an entrance hidden in that mound of spoil around the base. Scott and I are all for cutting the tree out chunk by chunk, but Nyami here will have none of it." He afforded her an indulgent glance to which she replied with a shrug. "So, it's dig we do."

"There's an accretion of ash on one side of some of the bricks we've collected at the top of the tower," Scott Buchanan offered. "It's possible the apex of the tower served as a sacrificial altar."

"We suspect it might be the tomb of this fellow." Burton patted Ets-eket on the headdress.

"Of course, we've not found any humanoid remains yet," said Tzia, entering the conversation for the first time. "Just small animal bones."

Burton cleared his throat. "The sheer volume of animal sacrifices we've found in the pits at the southern end of the complex is astounding. I've never seen anything to compare with it."

"Of course," said Tzia, "you have to sort the newer leavings—dead vermin and the like—out, or the data become skewed."

"The data," said Burton, voice sharp with irritation, "are as accurate as they can be."

Rhys barely heard the exchange, so intent was he on the figurine. Drinking in every detail, he lifted tentative hands to it, then glanced at Burton. "May I, sir?"

"What? Oh, of course." The older man made a sweeping gesture of welcome.

Rhys explored the figure with hands and eyes, memorizing every texture and nuance. "Marvelous! How old?"

"At least 5,000 years, yet even the softer metal is intact."

"Where did you find him?"

"In the Chapel. That's what we call that small annex to Temple One. He was still in his little carved niche beside the door. Wish we knew the Etsatat name for him, but well, they haven't got one."

Rhys opened his mouth to ask more, but Burton forestalled him. "Keep your questions for tomorrow. Time to turn in. The day starts very early around here, Professor Llewellyn." He rose and extended his hand to the younger man. "Wayne will show you to your cabin."

"I am completely and utterly happy." Alone with Rick and Yoshi in the cabin they'd been assigned, Rhys stretched full length on his sleep mat, luxuriating in the fine, rare sensation that rolled over and around him. The bleat of a night avian, the muted whistles and twitters of insects, the humid, warm air against his skin, the velvet quality of the darkness beyond the large windows. It was magic; it was medicine. He could *feel* the site out here waiting for him like a new friend, well met. The buzz of excitement he'd felt since setting foot on Etsat—no, since receiving Drew Burton's invitation to do so—faded pleasantly to a balmy whisper of contentment.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Rick shot Yoshi a wry grin and saw an answering flash in her eyes, even in the unreliable light of the single large moon filtered through copious foliage. "It is nice and peaceful here," he said.

Rhys snorted "Peaceful? Is that all you can manage, Roddy? Peaceful? You're in the presence of a legend, I'll have you know. Professor Drew Burton has done more to advance xenoarchaeology than any other single researcher, just by moving into the arena. Since he's been involved in extraterrestrial research, he's brought more attention to it, more sponsors, than it's ever had. I expect his published works in the field will soon define it."

"I thought his paper on the aboriginal cultures of Mandrorin was good," Yoshi said, paused and added, "but I found some of his views a little biased."

"Nonsense, Yoshi. Dr. Burton is a brilliant researcher. Look how much he's done here already. Do you realize they've been at this dig for only four months?"

After a moment of silence, Yoshi murmured, "I didn't like the way they called the Etsatat 'Linguine.' "

Rich snorted. "You take things too seriously, Yosh. It was a play on words. *Human* words. Burton's just pinched because the Etsatat aren't as agog at his discoveries as we are. I kind of think he imported us because he wanted to impress Rhys."

Rhys frowned into the dark. "Why in heaven's name should he care to impress me?"

"Because he respects you?" countered Rick, and Yoshi could almost feel the heat of Rhys's embarrassment beating against her cheeks.

"Good Lord, Roddy! Why should he respect—?"

"Maybe because you're the man who brought the White Temple of Tson to light after it had been buried for two millennia. Oh, not to mention that you were the first human to establish meaningful communication with the Tsong Zee."

"I didn't do anything that important. The Tsong Zee found their Shrine, and they established contact with us."

"He said, 'communication,' not 'contact,' " argued Yoshi. "You were their Key Master. You were their eyes. They couldn't have found the Temple without your help."

"Arguable. And irrelevant. Drew hadn't even heard of Tson."

"Then I guess he doesn't use his own camp library. It contains a number of major articles covering your discoveries there, and *someone's* been accessing them."

The silence hooted and whistled. Rhys yawned, rolled over and feigned sleep, but the burning of his ears kept him awake for hours.

Breakfast was a necessity Rhys would gladly have done without. But he ate, his ears barely catching the conversations at table, his eyes going again and again to the tower rising out of the mist-draped forest. The steamy veil had begun to break up a bit by the time they approached the temple complex. This time, Rhys



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

vowed, he'd keep his wits about him enough to take professional, objective note of things.

"The village," Burton explained as they drew up to the great stone gate, "isn't nearly as well preserved as this site. We actually started our work there. There's still a team at that site, but I moved the base camp here because this—" He made a sweeping gesture at the lichen covered walls, "—will likely yield much more fruit. Has already, in fact. Nyami's more interested in the village than I am. It's the cultural anthropologist in her."

Rhys nodded, studying the scaffolded archway above them. Made of large blocks of ruddy-mellow stone, its sculpted haunch served as the centerpiece of the cool-toned front wall. Behind the scaffolding that partially covered it, Rhys could just make out a large, central figure. "Ets-eket again?"

Burton smiled. "Indeed. Flanked by a fine bas relief. And it's in as remarkable shape as everything else here. You'll find Ets-eket is well-represented hereabouts." He led the way beneath the arch into the central plaza and Rhys was struck again by the sheer magnitude of the place.

Workers were already crawling over and around the buildings, carrying tools, instruments, finds trays. Rhys brought his eyes back to the tower where Scott Buchanan directed traffic for the group digging away the fall of soil and humus at its base. "That's brick, isn't it?"

Burton nodded. "Kiln fired, too, not Sun dried. We're hoping to find the entrance within the next week or so."

They toured each of the buildings in turn. What Burton called the Chapel had apparently been divided into several small rooms; the niche in which he'd discovered the Ets-eket icon was halfway up a broken wall next to a ruined doorway. The larger buildings—Temples One and Two, for the sake of identification—had been partitioned sparingly. Several small rooms ringed the perimeter of the huge main chambers which were buried in centuries of compost and littered with debris from the fallen roofs and overshadowing forest. Among the detritus of ages, diggers worked in their gridded areas, taking a decidedly horizontal approach to the site.

Rhys peered over shoulders, chatted with workers, and took notes on everything. In Temple One, he commented on the series of large rectangular depressions along the back wall. Burton immediately led him to one that was being excavated. The trough was lined with finely planed slabs of the native granite and looked as though it may have had at one time a highly polished facing. They'd already dug down about four feet and had discovered literally hundreds of potsherds.

"We suspect this was a storage area," Burton told him. "Possibly for foodstuffs the priests ate or used ritually. Or perhaps a burial cache of goods for the next life." He shot Rhys a sharp glance. "We *will* find a burial."

"The burial of Ets-eket?"

"Or of his mortal stand-in."

"You think he's a local or regional



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

deity, then, rather than a ruler of some sort."

"He could be both. Think of Osiris and his relationship to the pharaohs of Egypt. But Ets-eket's influence is hardly regional, Doctor. There are ruins half a continent away with these same structures and images. Generally they're in much worse shape —too bad, because it seems some of them were built on a grander scale even than this. But the cult of Ets-eket evidently extended to most of the inhabited regions of this planet."

Rhys raised a flamboyantly red brow. "That's amazing. In fact, it's unprecedented."

Burton grinned from ear to ear. "Now you understand my excitement over this find."

"Well, if it's that wide-spread, that rather removes it from cult status. It's more likely you're looking at the relics of a major world religion."

"Dear boy . . . ." Yoshi, at Rhys's shoulder, cringed at the patronizing note of rebuke in the professor's voice, "we're talking about the icon-ridden worship of a nature deity. I've read your treatises on xeno-religion. I don't mean to sound disapproving, but they reek of cultural relativism."

Rhys blushed to the roots of his hair. "I'm sorry you disagree so strongly with my theories."

"Theories?" Burton laughed heartily and clapped Rhys's shoulder. "My dear boy, *theories* can be supported by *evidence*. Your abstractions on the common roots of alien and human religion are dabbles in philosophy. Ah, but it's engaging reading, Rhys! You're a damn fine writer. Now, come, I want to show you the relief over the front gate." His arm around the younger man's shoulders, Sir Burton drew him away into the full sunlight of the outer plaza.

Yoshi, lagging behind, bit the inside of her lip to keep from saying something she might later regret. Rhys's work in xeno-religion, she knew, was the heart and soul of his anthropological world. It was clear Burton had no idea how close to his colleague's heart of hearts he'd stuck his egoistic dagger.

Watching her, Rick leaned in close to her presently red ear. "I heard that stream of mental abuse. Come on, Yosh, don't blow a sealant ring. I think your 'big brother' can probably defend himself if verbal fisticuffs break out. I thought he took all that wallah pretty well, don't you?"

"He shouldn't *have* to defend himself. Not to Dr. Burton. He has nothing but respect for that man. He doesn't deserve to be patronized.

"Respect?" Rick steered her out of the Temple One and into the plaza. "I'd say he idolizes him."

"Yes, I can tell. I'm not blind."

"Ouch! Yoshi Umeki, you, of all people, should understand that a little hero worship can be good for the soul. And for the career. You wouldn't be here if you hadn't made a hero of a certain Scotsman."

"It's not at all the same thing. First of all, I was sixteen when I met Rhys, and a sophomore in college. We have a student-mentor relationship because that's what I am until I earn my doctorate—his student. Rhys is a grown man and has a double degree



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

of his own. He's at *least* Burton's equal, but he doesn't see that and Burton's not about to encourage him to."

"So let me get this straight. You hate Burton because you think Rhys likes him too much."

"I don't hate him. I don't even *know* him. I just don't believe he's bigger than life."

"Uh-huh. Which is why you snarl secretly every time he opens his mouth. You know what I think? I think you've become overly protective of our dear professor of antiquities. And I'm beginning to think it goes a little deeper than that pseudo-sibling defense mechanism you've been packing for the last three years."

"Where'd you get the degree in psychology, *Doctor* Halfax? More Fool U.?" Her golden skin suffused with rose, Yoshi pulled out of his light grasp and strode ahead of him.

At the great stone gate, they joined the two archaeologists conversing below the scaffolded facade. "As you can see," Burton was saying, gesturing to where several people worked next to the carving of Ets-eket, "flanking the icon are twin reliefs. We've got a four-foot-panel pretty well restored." Waving, he caught Tzia's eye. "Why don't you all make room up there? I'd like to show off for our guests."

Tzia gave a peculiarly reptilian version of a human nod, her entire head rising and falling, and shooed her crew of three off the scaffold. Burton had just set foot on the bottom of the access ladder when his comlink chirped. It was Wayne Bell, calling him to the Chapel. He bid the others continue and left, promising to return quickly.

Rhys climbed the ladder eagerly with Yoshi close behind. When she glanced back at Rick, he shook his head and stuffed his hands in the pockets of his khakis. "That scaffold looks like my worst nightmare. I'm going to go prowl around those big square pits in the back of the complex, see what's being dug up there."

Yoshi shrugged and scrambled up to the fiberboard platform where Rhys and Tzia were already engaged in a close inspection of the wall to the right of Ets-eket. She hunkered down behind to peer between their heads. Rhys was running his fingers over the slightly elevated surface of the relief, which depicted rank upon rank of men dressed in garb similar to that worn by the Ets-eket effigy. The main departure from his styling was their headgear, which was drastically understated in comparison. They did look, Yoshi had to admit, like helms of war. Some of the men in the relief carried staffs topped by the same fat crescent or fan Ets-eket's sported. She supposed they could be weapons of some sort. She was honest enough with herself to recognize that she didn't want to see war helms and weapons because that's what Burton saw. She sighed. Bias made objectivity tough.

"This is amazing," Rhys murmured. "There's actually still a tiny bit of pigment left in these. The state of preservation is . . . exquisite."

"The elements on Etsatat are merciful," said Tzia. "The forest root systems have done the most damage."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

She shifted so Rhys could see the four-foot section to the left of the central figure.

Rhys scooted closer. "Looks like a wagon train. Goods for the god?"

Tzia affected the Xthni equivalent of a smile. "We're not exactly in agreement on this one. When Dr. Burton looks at it, he sees a train of tribute and an army of sacrificial victims or slaves."

Rhys studied the two slabs for a moment. "And what do you see?"

Tzia hesitated, her neck frill rippling with thought, then said, "I'm not certain. But I don't see slaves or victims. Where are their manacles? And notice that they seem to be wearing the same basic clothing—uniforms, one might say—that their so-called guards are wearing."

Rhys nodded. "Except for the crested helmets and staffs."

Tzia's head rose and fell. "Not only that, but those staffs look like dreadfully ineffective weapons. More like . . . ceremonial objects, symbols of power or rank."

"How does Professor Burton explain the anomaly?"

"There's no anomaly to explain," said Burton's voice from the scaffold ladder.

Tzia jumped guiltily, her sagittal frill flattening, and moved to put Rhys and Yoshi between herself and the other archaeologist. Burton pulled himself up onto the platform, his face a furious red.

"Tzia's mistake is that she has read the symbolic as literal. She tends to view archaeological evidence in the same way many people read mythology scripture. How many different *literal* interpretations of the Revelation of Saint John existed before hindsight rendered interpretation irrelevant? No, we must read this as we would read any religious script. To do otherwise would be to stumble into lazy and simplistic thinking. This is the symbolic record of a primitive people. If you want to see the meaning of the group, look to the representative figure." He rapped Ets-eket's stone kilt with the tips of his fingers. "*Here* is your warrior-king, armed with spear and scepter. Here is your man-god, wearing the crown of lordship. I'd appreciate it, Tzia, if you would leave the search for archaeological truth to those uniquely qualified to perform it—those with the *human* quality of imagination."

Neck frill rigid, sagittal frill completely collapsed, Tzia dipped her head in a gesture of defeat. Appalled, Yoshi glanced at Rhys. For the second time that morning, his face and hair matched.

"Professor Burton," he began, but the older man cut him off with a gesture.

"Come, Rhys. They've made another find in the Chapel." He had gone over the edge of the scaffolding before anyone could react to the news.

Rhys glanced apologetically at Tzia. "I'm very sorry. I . . . I thought your commentary was perfectly reasonable."

Tzia offered a thin-lipped Xthni smile. "Thank you. But you should not let Professor Burton hear you say that. He . . . does not like my unlaun-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

dered ideas."

Rhys frowned and started to ask what she meant, but Burton interrupted from below. "I say, Llewellyn! Are you coming or not?"

He gave Tzia another apologetic look and hurried down the ladder.

"What did you mean," asked Yoshi, as they watched the two men disappear beneath the arching gate, "unlaundered ideas?"

Tzia uttered a sigh that needed no translation. "When first we saw what this relief depicted, it was yet early in the dig. I did not then know it was wise to . . . advance my theories through Professor Deer-Walks-Here. Now, I am more careful."

"But surely Professor Burton respects your skills, otherwise he wouldn't have included you on his team."

Tzia's laugh was a thin trill of sound. "He respects Nyami. For his dig, Nyami he must have. I, Nyami, must have. So, to get Nyami, he gets me."

Yoshi caught up with the others in the large rear chamber of the Chapel. Rick sidled up to her, a puzzled expression on his face. "You all right? You look like the bluebird of doom."

"I'm fine."

"What happened up on that scaffold? Rhys looks like he ripped his favorite kilt and Burton's all red in the face."

"I'll tell you about it later," Yoshi murmured. "What'd they find?"

"Looks like their first real treasure trove."

It did indeed. The abundant coinage was rectangular and cut from some soft stone. The diggers had found it in a deposit in the far corner of the room, where Rhys and Burton were already hunkered down between photonic grid lines. Next to them, the three diggers assigned to the room stood and beamed. A fourth worker recorded everything with a holocam.

Burton's pale eyes were exultant as he held two of the coins up for the camera. "As you can see each one is embossed with the image of Ets-eket on one side and a sacrificial altar on the other. Further evidence of his pervasive force in this society."

"Looks almost like jade," murmured Rhys, turning a piece over in his hands. He ran an exploratory finger over the sculpted surface, noting the neatly cut hole in the center of Ets-eket's headdress.

There was more. Further digging unearthed what appeared to be a calendar. It had four rows of nine squares each; most squares embossed with one of three symbols—the tower with what appeared to be a flame dancing atop it, a rectangular object that looked like a wagon with spoked wheels, and a second rectangle which may have represented an altar, as Burton suggested, or anything else that was boxlike in shape. At the top of the stone slab was one of the ubiquitous carvings of Ets-eket. The symbols appeared in regular alternating order, except for the last three squares of each row, which contained circles.

Burton was thrilled with the discovery. "To find a religious calendar of this type is extraordinary luck. This



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

will tell us much more about the nature of the religion practiced here."

The day continued to go well for the archaeologists. By evening the team working in the quartet of pits along the southern wall reported that the detritus was exceptionally full of humus and animal bones abounded. Outside of these areas, bone finds were limited to partial skeletons or the carcasses of local vermin. The character of the bones was also of interest; most of them had been broken, many had even had the marrow removed and a great many more showed definite gnaw marks and cuts. Meanwhile, the team in Temple One turned up an incredible variety of ceramic—pieces of plates, bowls, ewers and cups from the plain to the ornate.

"I think we've found the banquet hall of an Etsatat Henry the VIII," joked one of the diggers.

The evening meal was taken in an air of celebration. Everyone, Rhys included, basked in the glow of discovery. As the glow faded and exhaustion from the busy, discovery-filled day took over, Rhys excused himself and went to the Finds tent. Yoshi was already there, poring over coins and calendar in the steady glow of the camp lights in the empty room. Rhys sat down opposite her at a sorting table, watching her make notes in her field journal. Eventually he began a lazy examination of the calendar.

"Rhys?"

Rhys raised his head. Yoshi had laid five coins in a row before her and was studying them intently. A sixth stone rectangle was in her hand. "Do you agree with Dr. Burton about these markers? That they were coins paid in tribute to Ets-eket?"

"Markers?" Rhys repeated, rubbing his eyes. "Dare I suppose your use of that term means you *don't* agree with him?"

Yoshi shrugged. "I'm not sure." Her mouth twisted wryly. "No, sir, I don't believe I do. Look." She pushed her journal toward him. An enhanced image of one of the coins was displayed in its flat hologrid. "This is the first marker in this set. The back of it. See the scroll design under the little building?"

"The little building? Not a sacrificial altar?"

"Well, that's what it looks like to *me*." There was a definite note of defensiveness in that. "Frankly, I think it looks more like a . . . a transport shuttle than it does a sacrificial altar."

Rhys smiled crookedly. "Whatever. Aye, I see the scroll work."

Yoshi brought up a second image on the journal. "This is the second marker. Same area."

Rhys concentrated on the play of looping lines below the squat, raised rectangle Burton had dubbed an altar. His brow furrowed of its own accord before he realized what he was frowning at.

"It's different," Yoshi prompted. "A different pattern than the first. And here's the third. . . ."

That scroll, too, was slightly different than either of the others. Rhys rubbed a finger over his lower lip. "Well, they are hand carved. Could be minor variations."


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Some of them aren't so minor. There's a second set with the tower on the back. The scroll work on those is also unique to each piece, almost like a signature. But look. . . ." She adjusted the display so it showed the flip side of the coin. "Here's marker number one . . . and number two . . . and number three. And here's one from a tower set. The effigies of Ets-eket are identical. Any variation could be accounted for by wear—it's fairly soft material, almost like, oh, soapstone."

Rhys picked up the journal and examined it closely, rotating the image on its display. The flame of fascination kindled in his weary brain. "They *are* identical. These aren't hand carved, they're . . . pressed. Good God, look! Here's a mold mark!" He ran his finger along one edge of the 3-D image.

"That's another thing," said Yoshi, her eyes gleaming, "they're not stone. But they're not synthetic either. They're . . . *smeltered composites.* Maybe that's what the tower was used for."

"Or this could be a hoax."

Yoshi shook her head. "I dated some of these myself. They're anywhere from 4,500 to 5,000 years old. The Etsatat evidently had some low level technology even then. I suppose they'd have to—they moved those building blocks of theirs from a quarry ten klicks away. There's something else, too. These 'wear marks' of Dr. Burton's?" She pointed out the feature in the journal image with the end of a tiny scraping tool. "I don't think they're wear marks. They're too . . . regular. I think these markers were intentionally scored. And I also think they were worn or carried on a thong of some sort. Look how the holes are worn at the top edge."

Rhys took the coin she offered him and peered at the top edge of it. She was right, it did seem to be scored, if randomly. And the hole in Ets-eket's headdress was indeed elongated toward the top. He picked up a second marker. This one bore the same scratches along the top edge, but unlike those on the first coin, they continued down one side edge as well. A third specimen had score marks almost all the way around it. Something ticked at the back of Rhys's mind. "Record keeping," he murmured. "Not coins, but *punch* cards?"

"I don't know, sir. But that would make sense taken in context with the calendar. Maybe the scores represent days." She nodded to the tablet of stone that lay between Rhys's forearms.

He glanced at her sharply, then turned his eyes to the calendar. "If you don't stop calling me 'sir,' I'm going to have to cast a spell on you." His right hand gave an absent tug on the thong of the Pa-Kai spirit bag that hung, always, around his neck. "And don't think I can't. It's well within my shamanistic abilities."

Yoshi, the words "yes sir" on her lips, blushed and fell silent.

Rhys was fingering the series of representations on the flat hunk of carved rock. "OK, we know these things: Etsat's rotation is 31.2 hours. The current Etsatat week is divided into nine days and the month is four weeks long; intercalary days are



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

added once a year at new year." He ran his finger down one side of the tablet. "I'd say that we're looking at basically the same calendar here."

Yoshi nodded. "The calendar—if that's what it is—seems to show one Etsat month."

"So," Rhys continued, "Burton thinks the altar represents worship days, the tower and flame represent sacrificial days, and the wagons, days when tribute is collected."

Yoshi raised dark eyes to his face. "Three sacrifice days, three tribute days and three worship days in every *week?* Doesn't that seem . . . ." The word twitched, uncertain, on her lips, then she dropped her eyes.

"Excessive?"

She shrugged one slender shoulder and Rhys knew that had not been what she had been going to say.

"There is the matter of the tribute train depicted on the gate."

The other shoulder shrugged. "And the dancing slaves?"

Rhys was momentarily speechless. In the three years he'd known her he had never heard Yoshi use that sarcastic tone of voice. "You really don't like Professor Burton, do you?"

She was toying with the end of the blue-black braid that fell across one shoulder. "Is it necessary that I do?"

"It . . . it distresses me that you don't. Drew Burton is an important person in my life. Why don't you like him?"

The braid's thong loosened under Yoshi's nervous fingers. "I suppose . . . he . . . reminds me of . . . Uncle Kenji."

Rhys listened for a moment to the antiphonal tag team of night insects, using that sparse cover to regroup. "Yoshi Umeki, I don't believe you've ever lied to me before in your life."

Her hands jerked, the thong disappeared and her unbound hair washed about her shoulders in a black tide. The look she gave him was both tragic and defiant. "I'm *not* lying! You remember Uncle Kenji. Father's eldest brother. An odious man—"

"I remember him. What particular odious trait of Uncle Kenji's comes to mind in this case?"

The insect chorus swelled into the pause. "He was a xenophobe."

Stunned, Rhys murmured, "Actually, he was a bigot. Your father's words, I believe." He got up and went to pour overly-strong coffee into a blue metal cup. He didn't return to the table, instead moving to stare out into a stygian forest night that was interrupted only briefly by the golden glow of camp lights. Funny, how some clichés of dig life were allowed to perpetuate themselves regardless of technology's advance. Dr. Burton's camp was like a slightly off-kilter reproduction of its ancestors—industrial-strength coffee in tin-enameled cups, camp lights that flickered as if a fuel-powered generator drove them and not the photon core of a time-altered spacecraft. He sipped the coffee; it was comfortingly bitter.

Behind him, Yoshi stammered, seeking innocuous words. "Uncle Kenji . . . Uncle Kenji was a man with strong feelings about his place in the world. I'm surprised he ever left Japan." That much, she comforted herself, was true.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"And Dr. Burton is also a xenophobe, is that what you're saying?"

Well, there it was. Yoshi set her chin. "I deplore the way he treated Tzia this morning. As if she were a rank novice. As if she didn't have Nyami's respect and a Stanford degree in archaeology. As if she were—"

"As if she were an alien?"

"Yes, sir."

"Tsk-tsk. Remember the spell, Yoshi." Rhys tapped his spirit bag. "I have to admit, I didn't want to read the incident that way, but . . . ." He shook his head. "I suppose I could say he's an old man. One who's only recently been exposed to other races of men."

"That would be excusing him. He doesn't deserve your defense."

Rhys turned to look at her, eyes narrowed. "This goes pretty deep, doesn't it?"

"It's not just Tzia. It's his whole attitude toward this planet, its people. The living cultures of Etsatat are repugnant to him. He's only comfortable with the dead ones."

"Mercy. And I'd've thought that impossible for an archaeologist." He came back to the table and laid his hand, palm down, on the calendar. "It's the love of my life, Yoshi. Looking at these little bits and pieces of the past and trying to see how they relate to the present—to the future. Looking at a dead culture in the hope of snatching a glimpse of its living shade. We're ghost hunters, Yoshi. Mediums." He smiled. "Shamans. Holding vast, expensive seances in the hope that maybe, just maybe, the dear departed will put in an appearance and solve her own mysteries. I thought we were *all* like that."

"You mean you thought *he* was like that."

"Ah, yes. Because when I sat in his lectures, read his works, studied his field journals, I thought, 'Here's a kindred spirit. A mentor. An icon.' "

Yoshi gazed up at him with honest pain in her eyes. "I'm sorry, Rhys."

He directed a wry grimace at his own naiveté. "I'm too old for heroes and role models, I suppose. But a kindred spirit would have been nice." He glanced at Yoshi's suddenly still face and experienced a twisted epiphany. "Aye well, maybe one kindred soul *is* enough, after all." He lifted her hand from where it lay beside her field journal and raised it to his lips. "I'll clean up here. You go settle in and get some sleep."

Face rose-gold in the camp light, Yoshi stared at him, her hand suspended between them. He retrieved it and tugged her to her feet, jerking his head toward the tube to their cabin. "Go on. You've got smudges under your eyes. In the morning, you'll be dead on your feet and blaming me."

She got up and moved to the access tube, her every move tentative, as if she'd only just learned to walk. At the door, she turned back to look at him, but he was already packing away the finds, intent on his work. Fingers curled into a fist against her chest, Yoshi ducked into the tube.

In the morning there was still no access to the tower. Scott Buchanan suggested they break out the last cut-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ter and go in through the side, but Burton and Nyami argued him down. It was as good a day as any, Burton said, to visit the village.

It was at least a town, Rhys decided. The word "village" seemed too primitive to describe the ruin that lay at the verge of the forest, its toppled buildings blending with toppled trees. The site was in nowhere near as good condition as Sper-ets; its walls looked as if they'd been chewed on by some massive grazer, its stone streets could almost have been mistaken for the random strew of an incontinent glacier. But among the trees were mouldering buildings which, if built to a less grand scale than Ets-eket's temples, were yet impressive and willing to yield fruit.

Of particular interest were the stelae that appeared to have dotted the single main avenue and its various cross streets. Many of the ruins had one or two nearby, seeming to establish a relationship between building and statuary. Even here, the image of Ets-eket appeared, apparently in connection with a building on one of the side streets.

Burton's smile increased with every utterance of amazement and delight his ex-student made. "A year from now, these stelae will be touring the museums and universities of Earth and the colonies," he enthused, lovingly caressing the shoulder of a female Etsatat frozen eternally in the act of pouring water from ewer into a pool. "No doubt the Leguini will thank me for removing them. Come, look at this one." He led them to a stele half fallen against a low wall. It showed another Etsatat woman sitting or squatting (it was hard to know what to call it with the odd jointing of the Etsatat legs) before some sort of rack. "A merchant's pack, wouldn't you say?" asked Burton.

A loom, thought Rhys, but was reluctant to commit himself to an interpretation in front of the older archaeologist. Still, in the cause of acknowledging Burton as a man rather than an icon . . . . "It could be a loom. See, the shuttle in her hand, this line of scoring from her hand to the structure, a bit of thread or yarn. Notice, too, the pattern between these uprights could represent the pattern being woven into the fabric." Rhys only just kept his voice from rising questioningly.

Burton shot him a sideways glance, then bent to peer at the stele's chipped and worn surface. "Well, hard to tell with this much erosion, of course, but I suppose you might be correct. She might be representative of the domestic arts—a goddess of hearth and home. Personally, I think she's a merchant deity. You know it's a very odd thing, Llewellyn, but nowhere in any of this wealth have we found anything resembling a fertility goddess. I can only suppose that Etsatat were more clever than most primitives and understood the role of the male in reproduction. In fact, I believe that the Ets-eket cult may be, at its root, a fecundity cult."

Rhys frowned. "What makes you say that, in particular? The connection with the moon?"

"That, and the rather obvious phallic appearance of the tower. I've stud-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ied the modern Leguini enough to know *that's* relevant. There are other details too, of course. If you'd like, I'll make my field notes available to you. I think you'll find them of interest."

"I'd like that."

"Hey, look at this one!" Rick beckoned from where he crouched next to a low vine-draped wall, holding a bundle of trailing greenery out away from the stones. What he had found was a carved panel, chipped and timeworn, that seemed to be part and parcel of the wall. It depicted four figures, seated in an uneven row, their legs bent double in that amazing and uniquely Etsatat way. They appeared to be eating and talking; hands gestured and ferried food to open mouths.

"Four guys selling pizza," announced Rick irreverently.

"Looks like a tea party," suggested Yoshi.

"Very good, Ms. Umeki," Burton praised her. "Though I think 'party' isn't quite the right word. Perhaps a tea ceremony? The ritual partaking of food is quite common in cultures dominated by theological concerns. Take the Christian communion, for example."

"Do the modern Etsatat have any sort of rituals you could use for comparison?" Yoshi asked.

"Not that I know of. But I doubt that would tell us much about the culture we're looking at here. The modern Leguini—that name suits them better, they bear so little resemblance to their ancestors—have no giant temple complexes, nor do they have a priesthood or icons."

*Shame, none of the fun stuff,* Rhys thought ironically, then cringed at his own cynicism. Aloud, he commented, "But then the religion of the Etsatat has become so ingrained in their daily existence, it hardly seems to matter. They may not feel the need to build and maintain centers of worship over many centuries. Perhaps they've evolved beyond the symbols and can face the reality head on."

"Well, whatever the reasons," Burton said, "we'll get no help from that quarter. As regards this particular piece, my reasoning is laid out in full in my field notes." He rose then, and led them off to look at what he referred to as the village amphitheater where, he postulated, ritual sacrifices took place.

Rhys slipped the card containing Professor Burton's field notes into his own journal and settled back to digest them. Yoshi joined him, her own notes close at hand, while Rick wandered off to see how far the tower dig had progressed. There were extensive entries on the town, as Burton had promised, and that was where Rhys started.

*Shta-ets—the City of the Moon—is in reality a large village whose artistry fills a narrow forested valley 130 kilometers northeast of the present day metropolis of Shta-vater. Stepping from my shuttle into the moist air of the forest fringe. I was amazed at the state of preservation of these very ancient ruins....*

Rhys skipped the preliminary comments about measurements and soil acidity and paged to the first descrip-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tions of local landmarks.

*The village amphitheater sits at its extreme eastern end—the direction in which both Leguin and the planet's largest moon rise. It was here that the ancient Etsatat may have sacrificed victims on the huge central altar before the eyes of rows of onlookers.*

Rhys ran a hand through his thick, red mane and sighed, unconscious of the gesture.

"Me neither," murmured Yoshi. When Rhys glanced at her she shrugged. "I think it's more likely they *mimed* sacrifices there than actually performed them. I'd guess it was a theater and his big altar was a stage. Look at the dimensions."

Rhys nodded. "Normally I'd agree with that, but surely Dr. Burton has seen something—"

"Something you missed? You noticed that there are patterns of very shallow ruts in that slab. You noticed that they were too regular to be weathering. He didn't notice that regularity."

Rhys's eyes went unfocused momentarily as he called the feature to mind. "Very odd that. Almost as if the same rites were performed over and over again."

"Or the same dances. Or perhaps a highly ritualized form of theater."

"Like Noh?"

Yoshi nodded. "I don't believe it's an altar. I could be wrong, but I don't think it is."

Without further comment, Rhys paged to the next image with its attendant description. What he saw was a selection of village stelae and a paragraph about the main street.

*Leading west from the place of sacrifice, the main avenue of Shta-ets is lined with buildings whose purposes may always be mysteries. Except for a granary, a metal-smith's and a kiln, we know little about what went on within these walls. What we do know is that many of them were dedicated to the gods of the Etsatat. The images below, clockwise from left: (1) Four warrior gods or chieftains share a ritual meal; (2) The Goddess of the Waters fills the world ocean; (3) A merchant goddess with her splendid pack; (4) Statue of Ets-eket sits outside a small temple within the village.*

"What does he say about Sper-ets?" Yoshi asked, eager to move on.

"Ah, yes, here . . . ." He read aloud. "'From its composition, to the dimensions of its structures, the Sper-ets complex is reminiscent of Caracol, still one of the most beautifully preserved sites in all of Mesoamerica. From the broad, once-cobbled Avenue of Tribute, to the towering central ziggurat to the massive temples flanking it, it reminds one insistently of the majestic cities of the ancient Maya.'" He skipped a couple of passages, then picked up the narrative again. "'That Ets-eket is aptly named is apparent from the crescent shape repeated over and over on helmets, staffs and scepters. That he is an important deity is obvious from the sheer ubiquity of his image. Even beyond the confines of the many places of worship dedicated to him—sites which are spread over Leguin 4's several continents—Ets-eket's image ap-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

pears on buildings and stelae in every locale where we have conducted even the most cursory research.'"

"In which."

"What?"

"*In which* we have conducted even the most cursory research."

Rhys wagged his finger at her. "Now, Yoshi. Don't be overly critical. I begin to think you're just immensely prejudiced against the old professor. And I can't imagine why. Even as many years of exposure to Uncle Kenji as you had—"

"I'm sorry. I'm trying to be objective, but he makes it so hard. He's so sure of himself, so smug in his interpretations."

"He's one of the foremost experts on just about any phase of archaeology you'd care to name. I suppose one might get a little . . . sure of oneself under the circumstances."

"It goes further than that. Whatever he looks at, Dr. Burton sees exactly what he wants to see. He can't *stand* it when you advance a reasonable theory before he does. He has to point out what you missed or . . . or . . . debate it point by point. He treats you as if you were still his student."

"In some ways, I suppose I am."

"You shouldn't be, Rhys. Not in this field."

He chuckled. "Well, I may have lost points with Drew Burton, but at least I've got you calling me by my given name."

"You're evading the issue. The issue is Dr. Burton's cultural bias."

"Yosh, questioning every theory that's put forth—that's what scientists are *supposed* to do. But I will grant you this—he certainly doesn't seem to question his own conclusions as thoroughly as he does everyone else's."

"Well, that's *something*," Yoshi muttered under her breath.

Rhys gave her a reproachful look and turned back to the field notes.

The week progressed predictably. To Rhys's growing chagrin, Burton lauded all efforts except the hapless Tzia's, debated—no, *argued*—every opinion Rhys advanced that either preceded or differed from his own, and continued to treat the alien dig as if it sat smack in the middle of the Yucatan peninsula. Questioning the great man brought anything from sweet condescension to gentle scorn. As when Rhys suggested the deposits of animal bones might be from something other than sacrifices.

"Really?" Burton responded, gold and silver brows ascending like the wings of angels. "I'd be interested in hearing your views, Dr. Llewellyn."

"I have no strong alternate opinions about the deposits, although I suppose the site might have served as a barn or a corral."

"No excrement."

"Or a larder. The bones might still be there because the larder was well-stocked when the complex met whatever fate it met. The deposits are concentrated in the southern pits and they're largely the bones of animals present-day Etsatat consider meat animals."

Burton raised a calloused finger. "Exception proves the rule, Llewellyn. Exception proves the rule. There



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

are also the bones of small creatures which are definitely *not* part of the modern food chain. Wild nocturnals—"

"Which could be vermin or scavengers that raided the building after it was abandoned."

"Which could also be small animals especially dedicated to Ets-eket. They are almost exclusively night-stalkers of one sort of another."

Rhys nodded. "All right. Nocturnal scavengers dedicated and sacrificed to a moon god—possibly. But why would they leave them around to clutter up the place?"

Burton's finger pointed skyward again. "Charnel houses have existed in many other cultures."

"For animals?"

"Why not? If the animals are considered sacred—"

"Sacred enough to eat?"

"Ritually, yes."

"Pet cemeteries?" interjected Rick.

Both men ignored him.

"Taxidermist?" This time Burton glowered and Rhys cracked a smile.

"You're wrong, Llewellyn," Burton said with finality. "These are temples. Places of worship, sacrifice and tribute. Everything we've found suggests it. No, *confirms* it. The animal bones, the potsherds, the metal tools and coins. I realize, of course, that it's only your relative inexperience speaking," he added and shook his head, thereby missing Yoshi's furious but silent retort. "If there were only some way I could prove it to you."

"What are your opinions about all this?" Rhys asked Nyami and Tzia later, when the professor had retreated to his cabin to work on his field notes.

The two women shared an enigmatic glance, then Nyami answered for both of them. "We're not paid to have opinions. At least not outside of our respective areas of expertise. That means I boss the crew and Tzia restores artwork. All of us," she added, glancing at Tzia again, "are keeping our own journals. And some us will be writing our own books."

"You've seen his field notes, then?"

"Of course." Nyami chuckled, brushing graying hair back from her forehead. "Drew sees gods and goddesses everywhere. 'Water goddess filling the world ocean.' Heck, I think she's probably running the local bath house."

Burton's team located the entrance to the tower at the beginning of the next week. That the building was hollow but for its organic centerpiece was no surprise—that feature had showed up clearly in the sonic profile. What came as a surprise was that the conical tower was lined with a tough amalgam of plant fiber and ceramic Rhys suspected would make a great material for orbital spacecraft and re-entry shuttles. This, in turn, was covered with a thick deposit of ash and soot. The floor was so deep in the stuff, a misstep could leave one covered to the neck with a fetching coat of powdery gray.

"Ashes to ashes and dust to dust," murmured Rick when they had spent the better part of a day sifting and digging through thick layers of invasive soot and char that hung in the



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

humid air and clung to clothing, hair, and skin.

Burton, occupied with running a sample through the Field Remote Analysis Unit (known affectionately among diggers as the Frau), looked up sharply. "Are you suggesting this was a crematorium?"

Rick blew a lock of lank brown hair out of his eyes and gave the professor a bland stare. "I'm in a deep hole, up to my elbows in fine gray soot. I just thought it was an appropriate comment."

Burton looked thoughtful. "An interesting one, Roddy. You may have unwittingly stumbled onto something. Although, I think the crematorium was likely sacrificial in nature. You recall the biblical story of Shadrach, Meshach and Abednego, of course."

Rick opened his mouth to tell Dr. Burton that he had never heard of Shadrach, Meshach and Abednego, and that further, only Rhys Llewellyn called him "Roddy," then thought better of it and asked, "Have you found evidence of any Etsatat bone fragments or DNA during your analysis?"

The question, neutrally posed, caused Dr. Burton to redden perceptibly and cast a sideways glance around the tree trunk at Rhys, who was digging with Tzia along one curved, fire-blasted wall. "No, actually. What I *have* found are large amounts of coal and some cellulose, trace elements of other organic compounds and carbonized bits of rock. Altogether a disappointment, I admit. I had hoped we'd discovered a burial vault. The modern Etsatat inter their dead . . . ." His voice trailed off as he read the data spilling onto the Frau's small display.

"Don't give up yet, Professor." Rhys straightened from his work, holding something out on the palm of his hand.

Burton pounced on it as an aging tabby might pounce on an unwary mouse. "Air! Air!" he cried, accepted an air bulb from Nyami and feverishly cleaned the object. The entire work crew ceased digging and gathered around in the glare of palm lights and overheads.

"It's some sort of jewelry. A brooch, by the look of it, or a medallion. And there's a jewel in it, too. I've never seen the stone before." He looked up at Rhys, fire in his pale eyes. "You're in charge here, Llewellyn. Nyami, you and I are going to subject this to full analysis. Right now."

Within seconds, the two archaeologists had disappeared into the entrance shaft and Rhys and the crew had returned to work. Three hours later, Rhys and Tzia had unearthed (or unashed) three more pieces of jewelry and a crude stone figurine. Scott Buchanan turned up a glob of interesting slag and one of the other diggers found a second partial figure made up of heavily carbonized hardwood. Eager for a report from Burton and Nyami, Rhys ordered the crew to "clear up their loose," then, with their artifacts in a finds canister, he led the weary team of grimy, sweat-soaked archaeologists back to camp.

Burton was still hard at it and Nyami nursing a bottle of cold tea when the diggers filed up to the Finds tent.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

She moved to intercept them, cutting Rhys off before he or anyone else could enter. "I wouldn't interrupt him yet," she told them.

Buchanan's ashy blond brows furrowed. "How does it take three hours to analyze a piece of jewelry?"

Nyami studied her squeeze bottle. "He's run the same battery of tests five times. I did the first set. He didn't like the way I did them, so he did them again . . ." she looked up at Rhys, ". . . and again and again."

"Whatever's the matter?"

"It's not precious metal for one thing, just an odd, rather impure alloy. And the stone? It . . ." She licked her lips and Rhys couldn't tell if the gesture concealed a smile or grimace. "It's not stone. It's man-made."

Scott Buchanan's brows rode halfway up to his receding hairline. "A fake stone? What's he thinking—that this is a hoax? That the Leguini have been hoaxing us?"

"He's thinking . . . ." She shrugged. "I don't know what he's thinking. But the stone is a hunk of *very* hardy glass which dates to about 5,000 B.P."

Rhys expelled a rush of air. "Can the Etsatat have found a way to foil our dating techniques?"

"Who knows? Maybe the ancients had junk jewelry."

"Look, I'm going to take this assemblage in to Professor Burton. Maybe I can help him make sense of this." Rhys tucked the canister under his arm and entered the Finds tent warily, his eyes on Burton's back. As he moved to lay the canister down on the sorting table, Burton glanced up at him, sweating even in the well-ventilated cabin.

"What've you got there, Rhys?"

"More jewelry. A couple of figurines—wood and stone." He unpacked the canister as he spoke.

Burton was at his side in a second, poring over the finds. "This is more like it! Yes, *this* clarifies the situation considerably. What we're looking at here, my boy, is a single cremation. There's may be no significant Etsatat DNA because the cremation involves only that one individual. These—" He held up a corroding brooch and the stone figure. "—are tribute, as I theorized previously. I predict that if we continue to dig, we will find the remains of *one man*—Ets-eket, himself—or his mortal proxy."

"What's your evaluation of the brooch?"

"Ah, well, originally I thought it a rather poor specimen. The metal is sturdy but hardly precious, the stone is, em, rather an enigma. But the *style!*" He put the thoroughly cleaned piece into the photonic bath and switched the perfect 3-D image to the holotank. "See the intricate detail, the precision of the scroll work? The Leguini haven't produced anything this fine since."

"What?"

"Well, you've seen their primitive-looking ornamentation. Ye gods, the shops are full of it, even on *Earth!*"

"Professor, that's a current *fashion,* like art deco on early twentieth-century Earth, or the turn of the century trend toward aboriginal art. There's no grounds upon which to compare it to *this.*"

Burton's face turned to stone.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Llewellyn, you have argued every single find with me since you arrived. Where do you get the gall?"

"From you, I'd like to think, Doctor."

"You were my favorite student, you know. When I brought you here, I thought you'd be appreciative."

"I am, sir, I—"

"Then why are you playing dog in the manger?"

"Sir, I'm *not*. I just happen to have formed some opinions about these sites that don't cozy with your own."

Burton went white and red in swift turns. "What makes you think your opinions are worth anything, Llewellyn? I've been in this field for decades. You've been *out* of the field since you left that classroom in Sophia to go commercial. Corporate anthropologist!" he snorted. "Corporate toady is more like it! How can you presume to think your opinion carries more weight than mine?"

Reeling from the verbal lashing, Rhys struggled to right himself. "I'm not presuming anything of the sort, Professor. But I *have* had a good many years of training *and* experience, and regardless of what you think about my association with Tanaka Corp, it's given me experience you haven't had. Your decades have been spent in Terran archaeology. My few years have been spent out here, on other people's worlds. When it comes to xenoanthropology, I think the playing field is much more even."

"Do you?"

"Yes sir, I do. And I think . . . ." He paused, losing the will to continue.

"Well, whatever it is, Llewellyn, say it. Don't add cowardice to your arrogance."

Rhys sighed, feeling wretched. "I think you may be culturally biased."

"Culturally biased?" Burton's white hair looked shockingly bright against the near purple of his face.

Rhys lowered his voice, trying to keep his tone gentle. "This isn't Caracol, doctor. It's Sper-ets. Hell, it may not even be that, really. The fact is, you can't know. You can't know whether a thing is a coin or a . . . a punch card unless and until you have some sort of cultural context to put it in. We don't have that context yet for these sites because we haven't built one."

"The context is a wide-spread cult dedicated to the worship of the moon. That is the context."

"On the surface, a reasonable conclusion. But we're supposed to get *below* the surface to the details. And the details here don't support many of your conclusions."

"Name a few."

"All right. What you call coins are identical because they were smeltered and molded. That's not stone they're made of, but a clever native composite of malleable ores. They're molded, yet they all have obviously handmade scoring along the edges."

"Denominations."

Rhys shook his head. "The number is totally random. Anywhere from zero scores to a complete circuit of the edge. Like a punch card. Then there's the relief on the gate lintel. You interpret as prisoners and sacrificial victims people who are in no way bound. You ascribe warrior sta-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tus to men without weapons or armor. You make moon crescents out of shapes that bear only passing resemblance to any stage of Etsat's moon. And the village—your massive sacrificial altar could just as easily be a place where people went to be entertained, not ritually murdered. Think about it, Professor, assume for a moment that we stumbled across . . . the ceiling of the Sistine Chapel with no cultural context. We knew nothing of the Renaissance—we'd never heard of Michelangelo. Without that context, you and I would very likely interpret the Last Judgement as depicting a warrior-priest in god's clothing surveying his sacrificial victims."

"You mean *I'd* interpret it that way. I'm sure you'd draw other conclusions."

"I don't have conclusions, Doctor. I have theories. Day's too young for conclusions. I talked about building a context and I meant it. The present day Etsatat hold the key to this place, whether they realize it or not. Look at their culture if you want to advance toward conclusions."

"Preposterous. I hadn't realized you'd become such an iconoclast."

"I'm not an iconoclast. I simply suggest that if you'd try to envision the village ruins as a living Etsatat town, you'll see some of these artifacts in a different light."

"What I see, Dr. Llewellyn, is that you and your associates are disrupting my dig and undermining my authority. I request that you leave. In fact, I demand it."

Rhys felt the blood drain from his face. He suspected that if he looked in a mirror, he'd find the color had drained from his hair, as well. "I . . . wish you'd reconsider."

"I don't think so, doctor. Now, if you'd kindly let me get back to my work?" He gave Rhys a curt nod and returned to his study of the holotank.

Back aboard the TAS schooner *Ceilidh*, Rhys tried to banish his black mood without success. He'd just blown a huge hole in his personal history and, glancing backward, saw a void where there had once been a professional relationship, a wall of regret where there had once been pleasant and important memories. His mental landscape was Scotland in winter—break, gray, cold. Neither Yoshi nor Rick could pierce the veil of sorrow that hung over him like a mountain-topping cloud.

"I'll get over it," he told Yoshi when he felt her eyes on him for the thousandth time since they'd left the surface of Etsat. "You were right, you know. I did idolize the man. I suppose . . . I suppose it's best that I've been reminded painfully of his humanity . . . and mine." He shook his head ruefully. "I couldn't believe he could be so . . . biased. I assumed that whatever expertise he applied so successfully to the Terran field, he'd apply to the broader field of xenoarchaeology and become the authority there, as well."

Yoshi looked down at her tea cup, held in hands that were as relaxed as she could make them. "*You're* the authority in xenoarchaeology, Rhys. And I think that bothers Dr. Burton



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

more than he'll admit."

"Rhys?" Rick's voice floated over to them from the intercom. "You've got a communication from Dr. Burton. I'll patch it through to the mess comlink."

Rhys made a face, his eyes meeting Yoshi's through the steam of tea. "I guess he hadn't quite finished flaying me."

But Burton apparently was no longer in a flaying mood. His face, filling the comlink's flat screen, wore a shining cloak of joviality. "Rhys! I'm glad I caught you before you left. I, em, I'd like to apologize for losing my temper earlier. It was unprofessional in the extreme. Unforgivable, really. I'd like to have you to a bit of a send-off party aboard our cutter—a bit more plush than the cabins at the dig."

Caught completely off guard by the older man's conciliatory tone, Rhys could only stammer out his acceptance. Several hours later he, Yoshi and Rick ferried over to the *Feathered Serpent* for the send-off. Burton greeted them in the docking bay with Wayne Bell at his side. He seemed cordial enough, but Rhys caught an undercurrent of nervousness and found it impossible to relax. The slightest misstep, he feared, would bring on another fit of professional vituperation.

What actually happened was much stranger. They were passing through the row of crew's cabins with Burton leading and Bell bringing up the rear, when the professor stopped in mid-corridor and slid back one of the cabin doors. "Dr. Llewellyn, if you and your associates would kindly enter and prepare for transport?"

A terrible shaft of cold shot up Rhys's back. "Excuse me?"

"I fibbed a little about the send-off. This is more in the nature of an educational field trip. I'm going to prove to you, beyond any doubt, that my theories about this dig are correct."

"I don't understand—" Rhys started to say, but suddenly he *did* understand. "You're taking us back in time."

"I am indeed."

"But this ship must have temporal grid limiters—"

Burton shrugged. "Easily disabled by someone who knows what they're doing. Did I mention that Wayne here worked his way through his first three years of college as a temporal engineer at QuestLabs?"

Rhys glanced back over his shoulder. Yoshi's eyes were big as saucers, Rick was looking positively ill and Wayne was holding a fuzz gun. He jerked back around to face Burton. "Doctor, what you're contemplating is illegal, not to mention unethical."

"Ah, for the casual time traveler, perhaps. But this is far from casual. We're on a mission of sorts—a search for truth."

"Professor, I protest. You can't do this."

Burton chuckled. "Watch me. I can play Indiana Jones as well as the next man." He leaned closer to Rhys, pinned him with over-bright eyes. "This is important to me, Rhys. I have to prove this to you. To myself. Now, if you'll kindly enter your cabin."

"Professor?" Rick was looking at



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Rhys with panic in his eyes and sweat beading on his upper lip.

Rhys swung back to Burton. "Roddy has severe temporal displacement syndrome. If we time shift, he'll become critically ill."

"Ah, so I should abandon this crazy idea, eh? Or send the young man back to the *Cetlidh*. I think not. Several of my crew have TDS. I know the precautions. Trust me—Roddy will be suitably sedated."

"I can't talk you out of this?"

"No, young man, you cannot."

Rhys glanced at Bell. "And you? How can you allow him to do this?"

"The professor taught me everything I know, Doctor. Unlike some, I'm not likely to forget that. You impugned his integrity. I think he deserves the chance to vindicate himself."

They shifted within the hour, moving millennia in time, but infinitesimally in space. It was a long shift, one which required every human aboard to be sedated against the displacing effects, though none so deeply as Rick. In the darkened cabin, wearing shift goggles and respirators, Rhys and his two companions slept while ages rolled back around them.

Rhys woke to total darkness and thought, for the briefest moment, that he was dreaming rather than conscious (or dead rather than alive). But Yoshi stirred and murmured on the bunk opposite his and he came completely awake on a surge of memory and adrenaline. If Burton's disabling of the ship's temporal grid limiters had worked, he was now orbiting a younger Etsat. About 5,000 years younger, if their dating was correct. He had called on the lights and was helping Yoshi to sit up when Burton appeared, his eyes bright with exhilaration.

"We're here. We'll shuttle down when the site is in darkness. That will mean turning off the running lights but there shouldn't be any other airships to collide with, should there?" He chuckled, obviously enjoying the extraordinary situation. Leaving the deeply sleeping Rick in the darkened cabin, he led Rhys and Yoshi to the mess for a pre-descent meal.

The squat, boxy little shuttle carried four people—Rhys, Yoshi, Burton and Bell, who acted as pilot. In the deepest part of the local night, they brought the craft in on instruments. A clearing in the comparatively sparse forest of a younger world afforded them a landing site with adequate cover between the village and the Ets-eket complex. Or so Rhys hoped. The thought of bumping into the Etsatat's ancestors filled him with mortal dread. Whatever else they did during this madcap adventure, they absolutely must avoid changing Etsatat history.

As the shuttle descended into the trees, Rhys saw a few points of firelight in the direction of the village and sighed deeply. He was torn about this "mission," and knew he shouldn't be. He should be outraged at Burton, but the thought of seeing first hand what he before could only theorize about made his heart hammer with pure excitement and his breath come quick



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

and shallow. He often daydreamed about what it must have been like during those brief halcyon days when scientists could, and did, use QuestLab's Temporal Grid technology to study the past. He had read the field notes of those early time travelers. He had seen the video journals. He had, in his personal library, the private diaries and logs of one Arthur Llewellyn, the man directly responsible for the ban on what his great-great-grandnephew was presently doing. It would be painful irony, indeed, if ill came of this.

"Rhys, look."

Rhys tugged his thoughts back to the surface and followed Yoshi's gaze through the starboard canopy of the shuttle. There was light in the direction of Sper-ets, too, a ruddy, volcanesque glow that lit the low clouds and smoke that lay like sleeping sheep above it. The tower, Rhys suspected, and felt a guilty tingle of anticipation. He felt eyes on him and glanced forward to find Professor Burton watching him with an odd little smile on his lips.

"You wouldn't stop this now if you could, would you?"

Rhys declined to answer that, but knew in his heart of hearts that Burton was right.

Dressed in forest camouflage and packing a proximity scanner, they used the still predawn hours to set up an observation post up slope from the village in the branches of a massive, gnarled tree. Sunrise gave them a clear view down the main avenue from almost directly above the amphitheater. What was only marginally apparent in the ruin was highly visible in the living town. There was one main street; all other avenues—there were ten of them—crossed it at a precise ninety degree angle. As the sun climbed, the denizens of those streets came out and began their daily routines, unaware of the alien presence watching them from the east through long-range optics.

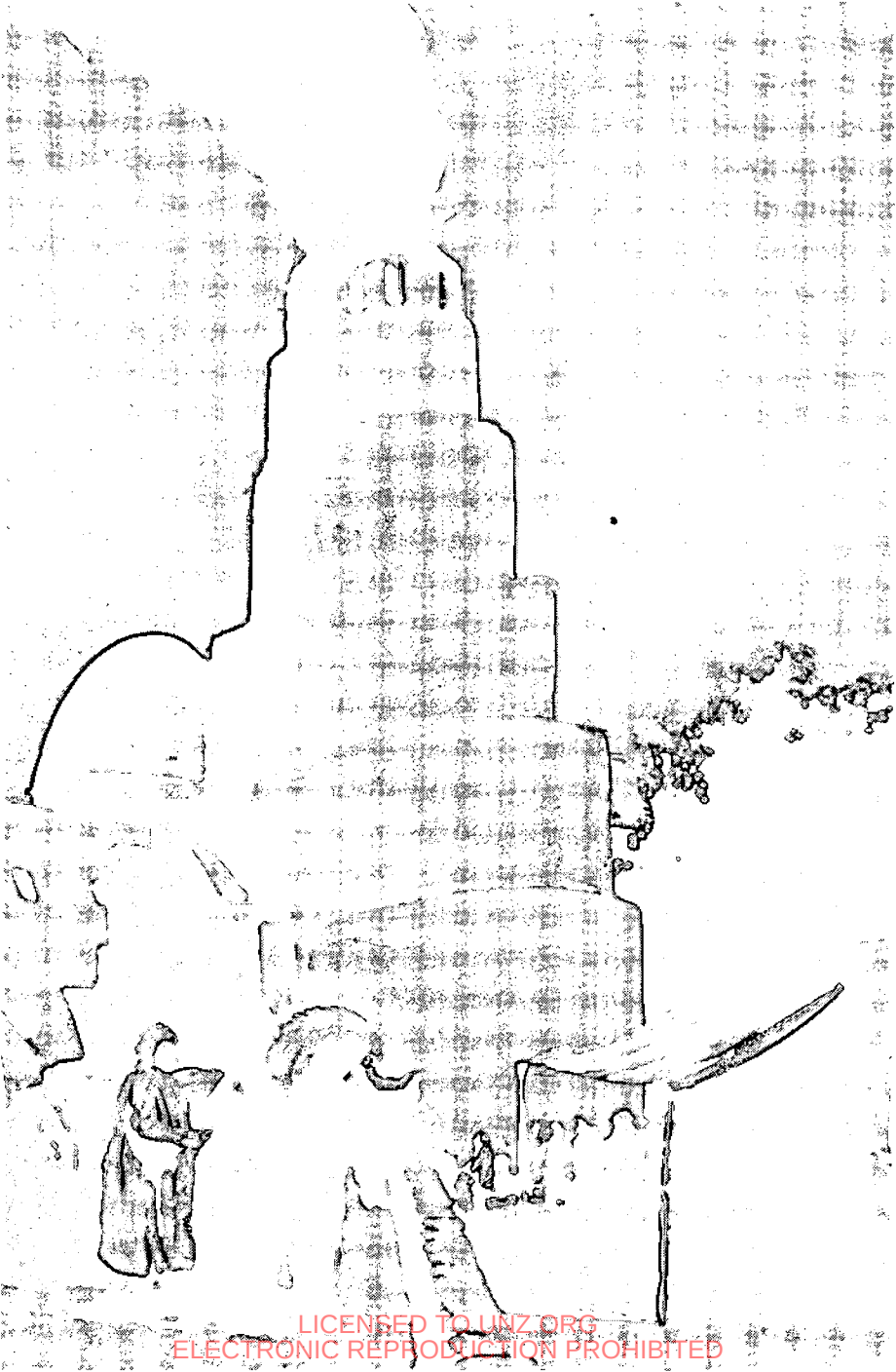
As expected, the market plaza was soon aswarm with buyers and sellers of produce. Traffic sprouted in the streets; carts and wagons appeared, most pulled by domestic animals called *tirzen*. Contraptions that looked like rikshas and handled like bicycles wove in and round larger conveyances. People wandered the avenues, popping in and out of buildings.

Rhys barely knew where to look first among such visual riches. Finally, he opted for a systematic survey of each street, beginning with those nearest his vantage point. He was focusing on the side of a large building adjacent to the amphitheater when Yoshi interrupted him.

"Sir, look at the stelae. They're painted."

They were, indeed. Rhys brought his own field optics to bear on the grouping they'd surveyed only four or five days ago. (Or was that five thousand years and five days ago?) The "Water Goddess" was done up in shades of turquoise and blue. The building she fronted was, likewise, awash in aquatic tones. Rhys supposed it could be either temple or bath house; the only evidence either


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

way was that some of the people entering seemed to be carrying clothing draped over their arms or carried in baskets or bundles.

"Now scanning building 1A," murmured Burton.

Rhys turned to find the elder archaeologist had mounted a holocam on his optics visor and was recording the street scenes. Or rather, he was recording the buildings—the people seemed to be of little interest to him. "What are you doing, Professor? You'll never be able to show that to anyone."

"Ah, but you and I will know, Rhys. You and I will know. Now, building 1A has before it a stele depicting a merchant goddess and her pack—"

"It's a weaver's shop!" Yoshi broke into the narrative.

"What?" Wayne Bell glanced from the holotank showing a Burton's-eye-to-view to a view through his own optics.

"See. That woman in the red halter went in unencumbered and came out with a little carpet or something draped over her arm. And there goes someone with a basket of yarn."

Sure enough, a female Etsatat came to the doorstep of the brightly colored building and held out the basket to someone just inside the door. She then set the basket in a sunny spot on the patio behind the stele where the colors of her wares shone like jewels. In a moment, a second woman joined her from inside the building and began to pick through the jumble of richly hued spools. In the end, she wagged her head and made a series of intricate hand gestures. Then she pulled several rings of bright metal from her necklace and handed them to the other woman who bobbed, turned, and left the yarns, basket and all, in the six-fingered hands of the newcomer.

Rhys glanced at Burton. He had stopped recording and had moved his holocam to another target. Rhys glanced at the locational grid on the holotank then adjusted his optics to find the building visually. There was the wall relief Rick had found so amusing. It was part and parcel of a shoulder height stone wall that enclosed a paved piazza. Wall and building were done in succulent colors overlaid on gleaming, white granitic rock. A woven awning stretched over the patio, undulating gently in the breeze. Beneath it sat five rows of low wooden platforms, two of which were already populated by kneeling and squatting Etsatat who seemed to be engaged in lively conversation. They used their hands much as they talked, all the while dipping into bowls and baskets of food spread before them. All in all, Rhys thought, they looked very much like the quartet of brightly painted fellows in the relief on the encircling wall.

"Four guys selling pizza," murmured Yoshi, hiding a giggle beneath her whisper. "I wish Rick were here."

Burton moved his focus yet again.

Wayne Bell frowned at the blur on the holotank. "Do you want me to do that, Professor?"

There was no response.

"I realize we're not supposed to be here, but I really think we should be recording this."



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"It's only a bistro," muttered Burton. "A stupid, mundane bistro."

"Professor," breathed Bell. "With all due respect—it's a 5,000-year-old *alien* bistro."

The day continued in much the same way. Wayne Bell eventually took over the recording, Rhys and Yoshi catalogued buildings and cultural features and Burton pouted, insisting that he'd never been as interested in the village as Nyami had been and grumbling about not having gone straight to the Sper-ets complex. By late afternoon, they had located two metallurgists or smiths, a spinner, a dyer, two mercantiles, an apothecary, two doctors or shamans, a wagon wright, a second bath house and two smaller eateries. There was also a building Rhys thought was an inn and a place south of the amphitheater that seemed to be a school.

There were homes as well, none over two stories tall. The only edifice taller than that sat just north of the amphitheater. It was different than the other buildings in town from the height of its facade to its shape and the character of its ornamentation. The curved face was taller than the roof behind it, giving the impression that the building wore a crown or tiara. The roofing was a tile of such deep indigo that it seemed to suck sunlight from the sky. Unlike other buildings, it had no paint upon either face and visible sides or around its many round windows. And into this building people did not go.

Until the sun began to set. But as the light mellowed and washed the white walls rose-amber, it seemed to become a magnet to the people of the little city. They came from every direction, many of the shopkeepers carrying colorful baskets, which they set, one and all, in a corner of the market plaza before crossing the street to the blue-roofed building.

Burton perked up. "What's this? They seem to be leaving offerings." He glanced at Rhys. "At sunset. Need I remind you what will follow the Etsat sunset by approximately fifteen minutes?"

"Moonrise," Rhys observed.

"But you don't suppose we'll see a worship ceremony of some sort, do you?"

"Professor, I've never denied that these people may have a nature-based religion. In fact, I'd be dumbfounded if they didn't have ritualized beliefs of some sort. What I doubted was that they consumed the entire culture, dominated every event, and produced every artifact from clothing to art."

In the dying light of day, the crowned building filled with Etsatats; the sun set; the moon rose, huge and white in the indigo sky. When it came over the top of the mountain due east of the watcher's tree, it struck a round patch of reflective material in the roof of the building and came face to face with its mirror image.

"It's a window!" breathed Yoshi, and at that exact moment, there arose from the building below a great ululating song of rapture. It was tunefully alien and did not stop until the orb of the moon had moved completely from the reflective round. Then the temple erupted from within with a blaze of pale light. Almost immedi-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ately, the worshipers began to emerge. Many of them carried torches or lamps that gave off a lunar gleam.

"Bio-luminescence?" Rhys wondered aloud.

"Look, they're filing into the amphitheater," murmured Bell.

Indeed they were. In an atmosphere of festivity, the crowd took seats on the terraced stone benches while torchbearers formed a corridor. Down it passed a small group of their fellows dressed in vivid costume.

Burton sat forward. "These will be the priests, I imagine."

The bright gantlet dissolved when the last "priest" had stepped to the edge of the large, flat dais. The torchbearers set their lights about the dais while the costumed ones divided into two groups. One took to the raised platform, the other formed a semi-circle to one side.

"The victims, perhaps," Burton whispered.

Yoshi ground her teeth. "The band, perhaps," she gritted, and before Burton could retort, lively atonal chords were indeed struck, and the "priests" began to dance and sing and chant.

Rhys found he could actually understand a few words and phrases that had been passed down to the modern Etsatat language of the region. The audience responded with hoots and chirps and pounded their oddly jointed knees in applause. Professor Burton withdrew so far against the trunk of their tree that Rhys almost forgot he was there.

Just before dawn they had packed up their blind and prepared to move out, when Burton, still on the supporting platform, uttered a startled grunt and manhandled the holocam into operating position.

Rhys, sitting at the platform's edge, scrambled to his feet. "What is it?"

"Put your glasses on, Dr. Llewellyn. You should be interested in this."

Rhys did as told and saw immediately what had Burton so excited. A wagon had come down the broad main avenue of the Etsatat town and pulled to a stop in the market plaza right next to the neat stack of baskets. Two men in uniforms garish even in the moonlight debarked and carefully lifted the baskets into their wagon.

"Recognize the costume?" Burton asked.

Rhys nodded. "From Sper-ets. The fellows on the gate lintel, if I'm not mistaken."

"Having second thoughts about that tribute train theory?"

"Maybe." Rhys watched as the wagon turned and rolled away. "Do we follow?"

Burton grinned fiercely. "What do you think?"

They trailed the wagon at a discreet distance, optics set for night scanning. It was a long trek through hilly, forested countryside, but all four of them were in good physical condition and the wagon, heavy and heavily laden, moved slowly. At one point, Rhys had stopped to refasten his boot closings when Burton let out an exultant cry and thumped him soundly on the back. When he picked himself up and reoriented his optics, he thought for a moment Burton had given him a concussion. Where there had been a wagon there were now two ponder-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ous vehicles making their dusty way toward the complex. In another half mile or so, a third wagon appeared from a rutted side road and joined the caravan. By the time they drew within sight of Sper-ets's gated walls, there were six wagons, each with its uniformed drivers, each with its load of brightly dyed baskets, and Rhys had to allow that Burton's tribute theory looked very good, indeed.

The sun was rising as they worked their way up into yet another huge and bulbous tree (*ficus frogus*, Rick called them). They could hear the rumble of the wagons, the calls and shouts and whistles of the uniformed men, the roar of the fire in the tower's hot core. In the broad plaza below and between the lavishly painted temples, the baskets were unloaded from the first wagon and grouped according to color. When the task was complete, a commanding figure appeared in the doorway of the Chapel.

Burton grasped Rhys's shoulder painfully. "It's Ets-eket himself!"

The warrior priest, his elaborate headdress making him stand head and shoulders above the other men, strode from his abode to meet the wagoneers. From each he received what appeared to be a necklace of the rectangular coins.

Rhys brought his optics into tight focus on Ets-eket's hand. The coins were strung on a thong, much like the one around Ets-eket's neck. The priest pulled a thick-bladed knife from his belt and proceeded to score each rectangle. He then returned the string of coinage to the driver who settled it around his own neck before returning to his wagon and driving away. This process was repeated for each driver, the only variation occurring when Ets-eket paused to remove several rectangles from the driver's thong to string them on his own. This done, he replaced them with new coins from a bag on his hip.

Out of the corner of his eye, Rhys saw Yoshi put her hand over her mouth.

A quick inspection of the baskets was next, which Ets-eket ended by clapping his hands together. A host of uniformed men poured from the Chapel and the two temples and began hoisting baskets with chaotic dispatch. A method emerged from the seeming madness: Blue and green baskets went to the eastern temple; brown and blue ones went to the western temple; the few red baskets found their way into the Chapel; and yellow baskets were set at the foot of the tower where uniformed men scurried to open them and spill their bundled contents to the earth.

Yoshi began to giggle.

Burton shot her an annoyed glance. "Really, Llewellyn, if your assistant can't control herself—"

Wayne and Rhys gasped simultaneously, jerking Burton's attention back to the tower where, at that very moment, the stone doorway was rolled back by a quartet of huge, sweating Etsatats, revealing a blast furnace interior. The four big men then took up crescent-topped staffs from a rack and proceeded to use them to scoop up the "tribute" and fling it into the fiery maw.

Yoshi's giggles collapsed into wild hiccups.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"It's a . . . a garbage dump!" whispered Bell.

"And recycling center," added Yoshi, punctuating the sentence with a hiccup.

Burton sputtered. "Impossible! What about the stone icons! The . . . the potsherds, the animal bones . . . ." His voice trailed off dismally.

Rhys sat back against the *ficus frogus*'s gnarled trunk. The gnawed animal bones. Of course. It made perfect sense, but even he had been too smitten by the romance of archaeotheology to see that any well-organized group of people must have some way of dealing with their discardables. "Don't feel too badly, Professor. I'm as stunned as you are." He shook his head. "And the evidence was all there, too, if only we'd been open-minded enough to read it. The small animal carcasses, the large caches of gnawed bone, the cellulose deposits, the extreme concentrations of potsherds, the tally cards."

Yoshi sighed, pulled off her optics and wiped tears from her eyes.

"Shovels," muttered Burton. "They were carrying shovels. *Garbage* scoops." He uttered a low growl that dissolved into a wheezing chuckle. "Staffs of office, indeed!"

"Well," said Bell philosophically, "I swear I'll never look at a potsherd the same way again."

"Pass the canteen," said Burton. "I need a drink."

Yoshi fished it out of the field kit. "It's only water, sir."

Burton gave her an arch glance. "Indeed. Well, I seem to have enough imagination for two men. I'll just *pretend* it's something stronger."

They had to spend the day perched in the great tree overlooking the dump. The time passed easily enough; they were shaded, relatively cool, had enough food and water for two days and plenty of activity to feast their eyes upon. By the end of the day, the system was quite clear: organic wastes went into the southern pits, broken stuff such as potsherds and glass went into the eastern "temple," and recyclable articles went to the west, burnables were sent straight to the fiery furnace. The "icons" they had found there, they reasoned, might have been toys that made it into the yellow basket by mistake.

After dark, they hiked the five or six kilometers back to the shuttle, their shadows cast indigo against the ground by the intense moonlight. Their departure from the planet was silent, the homing lock on the cutter's temporal grid transporting them in a blink through space and time to its shuttle bay. There was little conversation as they prepared for the shift forward. No mention of illegalities or arrests. Rhys knew without asking that Burton would bring the *Feathered Serpent* into synchronous orbit over the village exactly 5,000 years to the minute of when they'd left. It would be a matter of Rhys's word against his if accusations were made. He decided accusations would serve no one.

Five thousand years later they stood



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

in the *Serpent*'s docking bay. Rick was safely stowed aboard Rhys's shuttle and would likely sleep for another day or two—long enough for a return trip to Tson where Danetta Price would listen with feigned interest as they described their "vacation," omitting one important detail.

"Well, Llewellyn, I don't suppose I could talk you into staying on a bit. Helping out with the dig?" Burton was looking at the wall of the bay, not at Rhys's face.

Rhys felt a tingle of the same joy he'd experienced when Burton had first invited him to Etsatat. Still, he said, "I don't know sir. I suppose that depends on what you intend to do about . . . certain matters."

"Well, I've, em, rethought my position on some of the artifacts, if that's what you mean." He glanced at Rhys with a glint of humor in his pale eyes. "In fact, I'm thinking of completely rewriting my journal. I think it might benefit from a different point of view. I have the feeling that if I study the Sper-ets collection from a slightly more . . . pragmatic perspective—perhaps contrast and compare modern Etsatat cultures—I might even advance some new . . . theories."

"I rather think," Rhys said carefully, "that your relations with non-human colleagues could also benefit from a different point of view."

Burton had the good graces to look uncomfortable. "I'm an old dog, Rhys. You know what they say about old dogs. I'm not unaware of my bias."

"Prejudice," murmured Yoshi.

Burton glanced at her. "Prejudice," he agreed. "I can only plead that my lack of exposure to . . . other races of men has ill-prepared me to deal with them. I have never liked reptiles. The sight of a six-foot-tall lizard gives me goose flesh. But I suppose if I closed my eyes, Tzia would seem as human as the next qualified archaeologist." He met Yoshi's eyes. "I will try to listen to her without looking."

Catching Yoshi's barely perceptible nod, Rhys bowed to his mentor. "I believe we'd be interested in renewing our collaboration under those circumstances. I'm glad you've had a change of heart."

Burton snorted. "Change of heart? What was it Wayne said—that he'd never again look at a potsherd in the same way? Let me tell you something; I have immersed myself in Mesoamerican antiquities for over forty years. After our little jaunt, I shall never look at Caracol or Tikal or Teotihuacan the same way ever again. I shall wonder about every pyramid and stelae, every mural and icon. Dear God, do you realize that the statue of Chac Mol at Chichen Itza might have been an advertisement for Lamaze classes?" Finding that thought supremely amusing, he rolled away from his guests leaving a trail of guffaws.

Rhys looked after him for a moment, then put his arm around Yoshi's shoulders. "He's right, you know. If this escapade has served a purpose, it's been to make us question our assumptions. About a lot of things . . . . Now, let's go collect our duffel and hie down to the surface. Rick can sleep it off in the shuttle."

Yoshi nodded, her brow creased



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

with evident concern. "Sir," she said, and he sighed inwardly. "Is this a good time to tell you about the graffiti on the side of Dr. Burton's shuttle?"

He stared at her. "You put graffiti on his shuttle? Good Lord, Yoshi, I realize you don't like the man, but—"

She was shaking her head. "No. *I* didn't do it. I only noticed it when we debarked just now. It wasn't there when we went down."

"Do you realize what you're saying?"

She nodded, eyes glinting. "That there's a reason one of the calendar symbols looks like a little shuttle."

"No." Rhys steered her through the open hatch of their own lander. "I will not buy into this. You're having me on, for reasons known only to yourself."

She craned her head to glance back into the bay. "You're not even going to *look?*"

"No. Most emphatically not. We are not space gods, we did not interfere with this culture, and no one painted graffiti on Dr. Burton's shuttle."

Yoshi smiled—wickedly, Rhys thought. "OK, but I bet when we get back to Etsat you're going to look at a lot of things very differently."

She was right, of that much he was certain. He would look at *everything* differently. *And Yoshi,* he thought as they reboarded and battened down, *I believe I shall start with you.* ■

An error is the more dangerous in proportion to the degree of truth it contains.

—Henri F. Amiel

No man is good enough to govern another man without that other's consent.

—Walter Bagehot
(Submitted by Brian C. Coad)



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# ANALOG AND ASIMOV'S SCIENCE FICTION MAGAZINES

## Combo Classified Advertising Order Form

MAIL TO:

**DELL MAGAZINES**
**attn: Judy Dorman**
**Classified Advertising Dept.**
**15th Floor**
**1540 Broadway**
**New York, NY 10036**

15 WORDS MINIMUM
Only $72.00 for 15 Words or Less.
$4.80 Each Additional Word.
Capitalized Words Add $.60 per Word.

**SAVE 15% WITH 3 CONSECUTIVE MONTHS SAME COPY ORDER**

DEADLINE: Copy and payment must be in by the 5th day of the 4th preceding month for issue in which ad is to appear:

PLEASE PRINT OR TYPE

Your Name _____

Firm (Name in Ad) _____

Address _____

City, State, Zip _____

Phone _____ Date _____

Your Signature _____

| | |
|---|---|
| Basic rate | $72.00 |
| _____ Additional words at $4.80 each. | _____ |
| _____ Capitalized words at $.60 each. | _____ |
| Total amount for 1 ad | $ _____ |

**15% Savings With 3 Consecutive Month Discount**

| | |
|---|---|
| a. Multiply one ad total $ _____ x 3 = | $ |
| b. Multiply total amount on above line by x .85 | x .85 |
| c. Total amount for 3 ads | $ |

$ _____ is enclosed for _____ insertion(s) in the next available issue(s)

Specify heading _____

FOR ADDITIONAL WORDS ATTACH SEPARATE SHEET

| | | | | |
|---|---|---|---|---|
| (1) $72.00 | (2) $72.00 | (3) $72.00 | (4) $72.00 | (5) $72.00 |
| (6) $72.00 | (7) $72.00 | (8) $72.00 | (9) $72.00 | (10) $72.00 |
| (11) $72.00 | (12) $72.00 | (13) $72.00 | (14) $72.00 | (15) $72.00 |
| (16) $76.80 | (17) $81.60 | (18) $86.40 | (19) $91.20 | (20) $96.00 |
| (21) $100.80 | (22) $105.60 | (23) $110.40 | (24) $115.20 | (25) $120.00 |
| (26) $124.80 | (27) $129.60 | (28) $134.40 | (29) $139.20 | (30) $144.00 |

HOW DO YOU COUNT WORDS? Name and address must be included in counting the number of words in your ad. Each initial or number counts as 1 word.City and state count as 1 word each. (Garden City, New York, counts as 2 words.) Zip codes are 1 word. (Mark J. Holly, 1540 Broadway, New York, New York 10036 count as 8 words.) Phone numbers are 1 word. Abbreviations such as COD, FOB, PO, USA, 7x10, 35mm count as 1 word. PO Box 145 counts as 2 words.
PLEASE MAKE CHECKS PAYABLE TO DELL MAGAZINES.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# THE REFERENCE LIBRARY Tom Easton

**Midshipman's Hope,** David Feintuch, Warner, $5.50, 392 pp. (ISBN:0-446-60096-2).
**The Middle of Nowhere,** David Gerrold, Bantam, $5.99, 310pp. (ISBN: 0-553-56189-8).
**Humility Garden,** Felicity Savage, ROC, $4.99, 352 pp. (ISBN:0-451-45398-0 ).
**The Bohr Maker,** Linda Nagata, Bantam, $4.99, 326 pp. (ISBN: 0-553-56925-2).
**The Ultimate Egoist: The Complete Stories of Theodore Sturgeon,** Paul Williams, ed., North Atlantic Books (P. O. Box 12327, Berkeley, CA 94712), $25, 387 + xvi pp. (ISBN: 1-55643-182-1).
**I. Robot: The Illustrated Screenplay,** Harlan Ellison and Isaac Asimov, Warner, $14.99, 275 pp. (ISBN: 0-446-67062-6).
**Johnny Mnemonic,** Cinevisions, Inc., and William Gibson, Ace, $10, 164 pp. (ISBN: 0-441-00234-X).

Once upon a time, science fiction was often accused of being "space opera," meaning its stories were nothing more than "horse opera" cowboys and Indians and rustlers with the horses and stagecoaches and Conestogas replaced by spaceships, the Indians by aliens, and the cavalry by the Galactic Patrol. Such stories are still around, of course, but to be quite fair about it all one must recognize that a horse carries just one rider, and a spaceship has a crew. True space opera vanished decades ago, when writers realized that a better analogy was the seagoing ship, and that the stories to rip off were sea stories. So we've had tales of pirates and desert islands and mutinies, blockades and 3D line-of-battle confrontations. At least one writer has even supposed space-going *sailing* vessels, made of wood. And so on (with no intent to slight the air-wars, boy-grows-up, *Wanderjahr,* etc., models).

We've even had writers who have modeled stories quite explicitly on C. S. Forester's Hornblower series, one of the most readable, gripping, convincing yowsa-wowsas anyone can ever hope to discover. However, I don't think anyone has dared to model Forester quite as explicitly as has David Feintuch.

Just as Forester began with *Mr.*


LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

*Midshipman Hornblower,* Feintuch begins with **Midshipman's Hope.** His hero is Nicholas Seafort, a young midshipman on the *UNS Hibernia,* a vessel from an Earth ruled by the United Nations and a navy shaped explicitly on a British Navy that vanished when wooden warships went out of fashion. Feintuch goes to some pains to explain why the old patterns are worth resurrecting, and he is convincing enough to let us get on with the story.

The *Hibernia* is on its way to a distant colony. Alas, it is hardly out of sight of shore before disaster strikes, and Midshipman Seafort is the senior line officer left aboard. He is not competent; he *knows* he is not. But the regulations are clear: He is now the captain, with all the authority and responsibility implied by the title.

Of course, despite extreme self-doubt, he carries it off with panache. He saves the ship, fights off mutineers and pirates and aliens, earns the respect of his shipmates, and delivers the goods. He's Hornblower indeed, returned from the dead to ride the waves of space and thrill a new generation of youth for book after book after. . . . Yes, it's a series, with *Challenger's Hope* coming next.

Perhaps it will put some readers off that Feintuch is not treading new ground here. That's a legitimate criticism, and one that occurred to me as I began the book—indeed, it almost kept me from reading it at all. Yet Feintuch treads his ground so well that I must admit that the criticism faded from my mind as I read on. This is an excellent entertainment, marred mostly—to a biologist—by Feintuch's suggestion that alien ecosystems can consist of plants only, with no animals of any kind.

David Gerrold also owes more than a little to C. S. Forester. He doesn't hew as close to the line as Feintuch, but his Star Wolf series—it began with *Star Hunt*—has a strong smell of the sea behind it, and if there is no audible creak of rigging, there is a glimpse of periscopes and of ferocious would-be *Übermenschen* slashing at the throat of civilization.

In Gerrold's future, the stars are dominated by two human cultures, that of the Alliance of ordinary humans and that of the Morthans, genetically engineered "more than" humans who glorify paranoia and the martial virtues. *Voyage of the Star Wolf* introduced us to Jon Korie, executive officer of the badly damaged ship, *LS-1187,* and gave us a desperate fight to defeat a Morthan plot and an assassin. On the way to victory, Korie learned a great deal about leadership.

And now, in **The Middle of Nowhere,** he has more lessons to learn. He is not being confirmed in his captaincy, and the *LS-1187* is not being allowed to claim its *Star Wolf* name. Indeed, because it is infested with Morthan booby traps, it is about to be decommissioned, broken up for parts. He is furious, he wishes to resist his orders, to cleanse the ship of traps and go to battle once more, and he tries. But it is not be. He must learn to follow orders, to meet his responsibilities to his crew, his superiors, his



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

civilization, and his self. In the process, he will detect a catastrophic Morthan scheme and find a clever way to save the day.

As Gerrold has shown us before, he is deeply concerned with the individual's responsibility to self and others, to thinking clearly and acting effectively. He is less didactic here than he has been at times, and this novel therefore makes its points more gently. Yet in the cause of avoiding didacticism, Gerrold has spent so much time on background and reminiscence and byplay that one sometimes wonders where he is going.

Of course, Gerrold never wondered for a moment, and he always returns from his apparent digressions to keep his plot moving steadily toward its climax. At the same time, he is also planting the seeds from which he will grow the next books in the series.

Writers who publish their first novels while still in their teens are rare for a reason: The necessary talent and skill are rarely combined with youth, and even when they are, youth has not had the time to acquire the experience and background knowledge that can make a talented, skilled writer also a convincing one.

It is therefore an occasion for admiration and applause when a teen writer does as well as Felicity Savage does with **Humility Garden.** There are problems that can shatter the reader's suspension of disbelief (one does not mine bronze, which is a synthetic alloy, and while one can countenance a world of furry creatures that act more or less like humans and call their pets dogs, it is a bit too specifically Earthly a reference to mention preparing chihuahuas on a spit for a feast), and others that make it difficult to maintain identification with the heroine, who seems too prone to rapid shifts of loyalty. But overall this nineteen-year-old sophomore at Columbia University has produced a nicely original fantasy whose dark decadence may remind one of Tanith Lee.

The world is Salt, whose land mass is divided into a number of largish islands or small continents whose edges are inhabited by a humanoid people and their crops and herds. Inland lies the "salt," where the creatures—strange, large predators—can be found, and the dust, the "salt," can take root in a human's eyes, replacing the orbs with masses of sharp-edged crystals and conferring the ability to perform miracles. The people's religion centers on the worship of gods that live in Delta City, the capital. Salt-eyed priests roam the lands, doing their miracles, aided by lemans, youngsters who will when they grow up either visit the salt and become priests themselves or choose a more secular path and become nobles.

One of these priests comes to the country village where Beau and Húmi live. They are betrothed, but the priest says that Beau is beautiful and most come with him to Delta City to be made a ghost. Humi—Humility Garden—chooses to accompany them, and in due time the reader learns what it means to be made a ghost.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

On this world, dying creatures emit a solid, transparent essence, called diamondine, which tends to clog slaughterhouses. Those who make ghosts, the ghostiers, have the ability to trap this essence in the form of the body it occupied. Their art is to mold their victim, often with the aid of torture, into some desired configuration, kill, adjust the essence before it solidifies, and then paint it to resemble life, imbuing it with intense emotion in the process. Ghosts then radiate this emotion, as well as an icy cold, from the niches they occupy in the palaces of the nobility. They are also used to keep buffet spreads well chilled, in a perhaps deliberate echo of a mock ad for a ghost-powered refrigerator that ran in this magazine years ago.

Beau is therefore doomed. Humi even accepts, albeit after a bit of resistance, that his doom is right and proper in the context of their world and time. And then she adapts to Delta City, disguising herself as a ghost candidate, nearly getting ghosted, assisting in Beau's death, becoming a ghostier herself, and then —because ghostiers are a potent force in Delta City's politics—getting involved in her world's power struggles, one of which involves the chief god, who is about to die and wishes to upset the applecart as he goes.

Humi is an apt choice as Savage's vehicle for exploring Salt, and Salt itself is as apt a choice of vehicle for exploring certain metaphors of life, death, love, and divinity. Consider, for instance, that the salt is apparently the result of the long-past Conversion War, and it produces blinding crystals in the eyes of each devotee, whom a little child must then lead. If both the crystals and the salt are forms of diamondine, that would be a pleasing symmetry.

There will be a second volume. Thereafter we cannot tell, but with such a start, it is a very sure bet that fame awaits Felicity Savage.

Linda Nagata's first novel is phenomenal. Others have dealt with nanotechnology, its potential for transformation of both individual and world, and the fearful efforts of entrenched conservatives to stifle change, but few have done it in so convincing a way, with such a sure touch. This one is a winner—grab it when you see it, and look for it on prize ballots.

**The Bohr Maker** opens on the bank of a river running through a crowded, impoverished, tropical city. Phousita, a young woman whose growth was stopped by nanotech so she would appeal to certain wealthy customers, is gathering edible fluff from the river when a body floats by. She wishes to let it go despite the wealth its clothing represents, but Arif, her face-warped mate, insists on stripping it and then planting the body on the riverbed to be converted into fluff by the nanogadgets that convert all pollution into food. Unfortunately, as Phousita bends over the body, a needle erupts from its chest and injects something into her.

Now meet Nikko, son of a nanoengineer who once finagled permission to design a human who could live in vacuum, although the fearful powers



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

that be insisted he build in a time limit. The time limit is nearly up, and Nikko is playing lover to Kirstin, the chief of police, in desperate hope of persuading her to rescind his death sentence. But Kirstin is a hard-line Gaia freak, dedicated to protecting Earth and all its creations from the hazards of change; she turned in her own true love when he designed the Bohr Maker, a nanowhizmo that could make a human being perfectly adapted to his or her environment, and it is her job to keep nanotech weak. Nikko has no hope.

Or has he? Using an alternate persona disguised as his brother Sandor, he has persuaded Van Ness, the police researcher who keeps the only extant copy of the Bohr Maker's recipe, to sneak it out of the lab. When Kirstin hears what Van Ness has done, she goes ballistic. The search is on, and the technology of the time ensures that it is only a matter of time before the Maker is found.

Not surprisingly, Van Ness turns out to be the body in the river, and Phousita was in fact injected with the Bohr Maker. She soon begins to feel its effects, one of which is the ability to heal with a touch. Since she is a kind, caring, good person who wishes to ease the pains of others, she quickly makes it clear that the Bohr Maker holds enormous benefits. Official paranoia is not justified, although of course the same technology could be used for wicked ends.

Is this the point? Consider Nikko's dad at Summer House, a huge construction sunward of Venus, grown by nanotech from the material of an asteroid. It is a gloriously intricate artificial ecology, a living city, and he is working on a way to grow it—with its inhabitants—from a seed. He makes the Bohr Maker look like the antique it is, a rudimentary, primitive expression of nanotech potential. And, of course, Kirstin would like nothing better than to destroy him, his sons, and all he has ever built. After all, if a Bohr Maker or a Summer House seed were to get loose, to spread, the world would be irrevocably changed.

In due time, Nikko, Phousita, Kirstin, Summer House, and other factors all converge. Does Kirstin succeed in her nefarious aims? You know the answer, and Nagata makes sure we do not miss her real point: "Make yourself new," she has a character say. "It's the only way to move on." Is there a risk of losing important things in the process? There is fear, there is danger, but making new is the only way to move on. One cannot hold onto the old forever.

Indeed, if only the Kirstins of the world—and there are far too many of them—could realize, this is the way the world they wish so desperately to preserve really works. Ecological succession in the shorter term, evolutionary change in the longer. Unfortunately, the human sense of time is by and large so restricted that we see only stasis and struggle to maintain it quite against the natural order. To a Nagata, it is no surprise that the struggle is doomed, and it is worth enormous applause that she has dramatized this truth so marvelously.

* * *



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

The late Theodore Sturgeon (1918-1985) was a prolific fellow with a prodigious reputation. He is counted among the gods of SF&F for his attention to character and emotion as well as for the way his ideas crept into the stories of other writers (see Arthur C. Clarke's introduction to the volume at hand, as well as the way "It" spawned "The Swamp Thing" and "The Hulk," among others).

Sturgeon began his publishing career in 1938. Many of his first stories—not even remotely science fiction—were short-shorts written for newspaper syndication. Yet even from the start his bent toward SF was there, and his output shifted more and more in that direction as he realized that that was where his truest audience lay.

We can see the change as we read through **The Ultimate Egoist: The Complete Stories of Theodore Sturgeon.** Paul Williams has here collected 46 stories Sturgeon wrote between 1937 and 1940, including a number that are published here for the first time. Most are cute, clever, slight pieces, truly newspaper ephemera, many of them quite naive. A few—"Bianca's Hands" is the prominent example—show the promise of later greatness. Williams's notes, quoting from Sturgeon's letters to his mother and fiancee, illuminate the circumstances in which the stories were written and help to place them in the contexts of the times and Sturgeon's career.

This one is essential for libraries and for Sturgeon collectors, who will be delighted to hear that it is only the first volume of what is planned to be a ten-volume series. Perhaps we should note as well that editor Paul Williams is the founder of the rock music magazine *Crawdaddy!*, the author of a book on Bob Dylan, and Philip K. Dick's literary executor.

Years in reaching the scripting stage, more years as script after script was prepared until Harlan Ellison did a superlative job—so said Isaac Asimov—and then more years in Hollywood limbo because Ellison (he says in his introduction to the book) told the studio honcho he had "the intellectual capacity of an artichoke," it's still "the Greatest Movie Never Made."

Want to see what I'm talking about? Pick up a copy of **I, Robot: The Illustrated Screenplay,** script by Harlan Ellison from four of Isaac Asimov's robot stories (with traces of others). It opens at the funeral of Stephen Byerley, when an enterprising reporter spots the aged, reclusive Susan Calvin. He tries to get a word with her, but bodyguards shunt him away. Intrigued, he begins to hunt for a way to get an interview with her, and the hunt leads the script through scenes that correspond to the original stories to show Calvin's history, bitterness, idealism, and more, culminating in a vastly promising hint that humanity is growing up at last. Along the way, Ellison takes some liberties with the canon, replacing Gloria, the child who in "Robbie" lost a robot playmate-nannie, with Calvin, but if that did not perturb Asimov, it should not perturb us. And Ellison assures us that



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Asimov said in 1978 that the script would enable "the first really adult, complex, worthwhile science fiction movie ever made. . . . You've . . . kept the stories mine in essence and in much detail . . . kept in the spirit of *I, Robot* . . . kept Susan Calvin *my* Susan Calvin and that is wonderful."

It's not all hype, folks. Ellison did indeed make a compelling story of Asimov's material, and the script would indeed make a grand movie. It really is too bad that the only place it will ever play is in the theater of your mind.

William Gibson goes Hollywood this year, having converted his short story, "Johnny Mnemonic," into a script, which in turn has become **Johnny Mnemonic** the movie, a TriStar release starring Keanu Reeves, Dolph Lundgren, Dina Myer, Barbara Sukowa, Ice T, and Henry Rollins.

Want to compare script and short story, with movie stills for decoration? Then get *Johnny Mnemonic* the book, which gives you precisely those three components, and you will find the comparison quite interesting. Gibson's short story is fast and flip, the tale of an underworld character who carries illicit data in brain-implant chips. The trouble is that this time Johnny has his brain full of some very hot stuff, and the big guns—including a killer with a monomolecular filament hidden inside a false thumbtip—are after him. With the aid of an ex-Navy porpoise, however, Johnny survives and puts the data on the net for all to see. The script has the same elements, rearranged a bit, but it also has a number of others that give the story a poignancy and pathos that make it, while still fast, less flip, stronger, better. Indeed, it's enough better to make one wonder why Gibson stopped when he did in his earlier labors.

The result is an entertainment that should wow everyone who hasn't met the cyberpunk world and furniture before, and many who have. On the other hand, it's hard to call either script or short story any more than sci-fi in Norman Spinrad's sense of the term, meaning that a plot summary says it all. *Johnny Mnemonic* is about far too little besides itself.

**BOOKS ON DISK**

Build your collection of long out-of-print public-domain classics now. Noted bibliographer and small-press publisher Mark Owings, 1113 West 40th Street, Baltimore, MD 21211-1749, has added four more disks to his list, available for $1.00 each, plus $1.50 shipping and handling per order (MS-DOS only, and please specify the disk size you wish). He hasn't yet delivered on his promise of *The Monikins,* James Fenimore Cooper's long 1835 novel about the discovery of civilized monkeys, but he does give us John Kendrick Bang's *Mr. Munchausen,* an extension of the more famous work by Raspe and a delight to any lover of tall tales.

He also offers Max Ehrmann's *A Fearsome Riddle,* a mystery involving the nature of time, and *Roots of the Silver Tree,* a two-disk anthology that includes work by William Morris and Mark Twain; there's even a translated



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Icelandic saga.

From Serendipity Systems (P. O. Box 140, San Simeon, CA 93452) comes C. J. Newton's *Costa Azul* (9.95 + $2 s&h). This one is not at all SF, though it does deal with the relationship between technology and society in a strangely satirical way (there is also the SFnal techie format). In the land of Costa Azul, a car involved in a fatal accident has been arrested for murder. The stars of the tale are self-important, self-aggrandizing cops, lawyers, judges, and politicos, the standard representatives of society, every one of them performing in a way that would delight the heart of Leonard Wibberly (remember *The Mouse that Roared*?), not to mention a hundred other parodists. Unfortunately, for all of Newton's zest for the task, his prose lacks the energy of a Wibberly. Newton is given less to action than to lengthy, ruminative setups, a wealth of local color, and fond regard for even the silliest of traditions. The tale is a charmer, but it is surely not for all. ■

# IN TIMES TO COME

A new novel by Lois McMaster Bujold is always something to look forward to, and we're proud to have one beginning in our next issue: *Cetaganda*. You probably recognize the name, if you've read other tales of Miles Vorkosigan (and if you've *haven't* met Miles before, there's no time like now!); but this one actually takes you there and immerses you in Cetaganda's unique culture. You'll find it's quite a place, and full of challenges for an outsider. We're often told that we're entering an "Age of Information," but Cetaganda carries that concept to new extremes. In such an age, obviously, power is closely tied to control of information. But what are the most concentrated and important packages of information humans deal with? Why, DNA, of course. . . .

Our October fiction offerings will also include a new Robert R. Chase novelette, "The Wellness Plague" (set in the same peculiar world as "The Changeling Hunt," which we published a few years back) and very different stories by Bud Sparhawk and James Gunn. The title of Joseph P. Martino's fact article may seem a bit odd: "At Last: Computers that Do Math!" You may think, "What *else* would they do?" but the fact is that, until recently, they were used for just about everything imaginable *except* the kind of math that scientists and engineers use every day. Recently, though, that's been changing. . . .



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# BRASS TACKS

Dear Dr. Schmidt,

I read your editorial "Wishful Egalitarianism" with a decided sense of irony, as it arrived on the same day as a newspaper article describing a school board referendum considering banning homework in a nearby school district.

I have been teaching in public and private schools for five years, and have witnessed the phenomenon of "curriculum by wishful thinking" so often that I have long since resigned myself to regarding it as one of the hurdles facing teachers every day, such as violence in the schools. I am happy to see that I am not alone in viewing the prevailing administrative attitudes as perhaps the greater threat to the future of America.

It is appalling to me that the education system has instilled the concept of "self-esteem" as the primary purpose of school. Imparting even basic literacy skills has too often fallen far down on the list of objectives schools believe they should accomplish, and I have been in schools where these skills have been openly dismissed as unimportant in light of the social engineering that schools see as their primary raison d'être. The manipulation of test scores (and outright banning of same, in some instances) to be replaced with gimmicks such as portfolio assessment and other methods designed to hide a student's skill deficits from their parents and from the students themselves is just one symptom of this pervasive ideology. The biggest moral flaw of this entire system, in my opinion, is the complete invalidation of effort as a contributing factor to success. When nothing is required of students, everyone "succeeds." (And literally nothing is all that is required far too often. In heterogeneous groupings the curriculum is watered down to meet the needs of the lowest performing students, and with the current legal "full inclusion" mandates to include even the most severely mentally handicapped students in every class, that standard has dropped to unbelievable levels. The student who learns quickly and well can quite conceivably learn absolutely nothing at school—often he or she learns to read from parents or some other source, and basically educates himself. School has become a political indoctrination center in far too many cases, and the "self-esteem" movement has given the people responsible means to hide the fact that students are rarely taught anything worthwhile. The consequences of ignorance are postponed



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

until the students reach the job or college markets, and by then they are no longer the problem of the local schools.

But the responsibility does not rest with the schools alone. American society has come to depend on their local schools to provide services far outside traditional academic training. Day care, preschool programs, poverty programs, drug programs, multicultural awareness programs, gang prevention programs, crisis counseling, and psychological and medical interventions are all mandated school services in various schools I have worked in or for, and the list is growing. Ironically, schools have not been noticeably successful in achieving the goals of these social engineering programs, even after sacrificing academic achievements for the sake of these activities.

I have been told to pass students on to the next grade even when they have not been in class at all, or have done nothing whatsoever but disrupt if they have been there. The rationale for this is that failure is bad for a student's self-esteem. I rather thought the failure had already occurred, and that retention was simply the consequence of that. (To say nothing of the injustice to the students who persevered and learned something, who must now suffer through yet another year with classmates who do not know the prerequisites to any higher learning.)

It seems clear to me that we are rapidly becoming a dichotomous society—an educated minority and those who have been ensconced in the self-esteem movement, assured of their "worth" by teachers regardless of their skills. We are condemning a child to far fewer options as adults when we allow them to remain uneducated in the name of self-esteem.

In any case it strikes me as supremely arrogant to assume that any child will automatically place much value in the word of a teacher who tells that child how wonderful he or she is without a scrap of evidence to back up her words. In my experience, those students with the least self-respect are the least interested in the opinion of teachers. It has been my experience as well that even the most difficult students usually respond when they can be shown that effort does produce learning. I taught handicapped delinquents for a few years. When one of them learned to read I could prove to them that they could do something they couldn't do before. That seems to have had a greater effect on this nebulous "self-esteem" than any amount of social-worker maundering ever did.

I teach at a private school now. Our waiting lists are long, yet we have very few of the gadgets that modern educational journals tell us are necessary for today's education. Our students come from many ethnic and religious backgrounds, and we attract many foreign children to our school while their families are in the states. It has been enlightening that the academic rigors expected at this school have, for the most part, been expected, even welcomed, by parents of students from other countries. If one child takes two hours to com-



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

plete their homework while another completes the same work in thirty minutes, they do not demand that the workload be lessened for the slower child in the name of "fairness." This is a more and more common demand among our American parents. They sometimes claim that it is bad for the self-esteem of their child to spend more time or effort at a given project than another child in the same class.

I think these parents have forgotten that the purpose of education is not to provide some sort of structured day care. The purpose of education is to leave a child with more skills and knowledge than he or she arrived with, and that in schools with standards he will be expected to attain a certain amount of these skills before he will be included in classes that deal with higher skill levels. In other words, if he doesn't do the work, he will flunk. This has nothing to do with his value as a person, and certainly nothing to do with the amount of affection the teacher feels for the child. It is simply a matter of objective standards that the parents agreed to when they enrolled their child in the school in the first place. If a child is lucky enough to be able to learn quickly, that's wonderful. Yet a gifted child who expects to coast through on intelligence alone will quickly realize that this is not adequate, and have to expend at least some effort. Likewise, a slower child may have to spend more time to reach the same goal, but they will know just as much as their more gifted peers when they have finished. It seems far kinder to teach a child the consequences of ignorance and laziness while they are in school (where they can still redeem themselves) than to condemn them to dealing with their skill deficits as adults in a competitive job market.

Yet the California school board in today's paper is considering banning homework because it interferes with the "family values" of their students. Apparently they feel that spending time with the family is more valuable to their students than completing academic tasks. Perhaps when these students reach college age and find they must compete with students from demanding schools, and students from foreign countries; they will find themselves spending more time with their families than they had bargained for.

This is not the first generation that American schools have indoctrinated with the concept that academics are unimportant. It is imperative that it be the last. Parents must demand that their children be held to some sort of recognized academic standard, and that their children are allowed to be placed with classmates that have met the same standards. This is not ability tracking—this is effort tracking, and that is true egalitarianism.

AUDREY LAWSON

Lodi, CA

Dear Dr. Schmidt,

In the article, "The Bug, the Mouse, and Chapter 24," Charles L. Harness does not discuss the role of the (to me) clear and obvious precedent for the "patentibility of life," namely plant patents. However, that is merely an aside to my main point. He emphatically declares that we have seen only



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the tip of the tip of the iceberg when it comes to biotechnology, yet he does not point out what is to me, the most important reason why this is so.

I believe that biotechnology is on the verge of becoming an "escaped technology." What I mean by "escaped technology" is a technology which, because of the presumed requirement for specialized knowledge and expensive specialized equipment, can only be applied by (and therefore be profitable for) an elite group. The "escape" occurs when a backyard tinkerer with some of the requisite knowledge looks at the problem and says "I can do that," and proceeds to upset all of the plans and controls of the established elite. The most recent example being the development of the C band satellite television industry. All of which occurred when a guy in Oklahoma decided that you did not need all of that fancy equipment to see what the television networks were beaming down on everyone. Another, not so recent, example occurred at the beginning of this century when a group of "radio amateurs" discovered that by using frequencies deemed "unsuitable" by the commercial operators, one could establish world-wide contacts with very simple equipment.

Biotechnology will escape first among plant breeders where some of the techniques (cloning from the "callus") are already in use by commercial orchid growers among others. When this is combined with the backyard plant propagators whose holy grail is the blue rose or something similar and who become impatient at the slow and uncertain results obtainable by the traditional methods, we will see thousands of backyard genetic engineers. As the techniques become more routine and simple, the next step will be animals. High or low, it doesn't matter. You tweak what you have in hopes something interesting will result.

Now, if you combine the escaped technology along with the ten thousand monkey principle and throw in the already existent, somewhat naive belief in becoming rich and/or famous by patenting some instant best-seller, you get a recipe for "*You Ain't Seen Nothin' Yet!*"

And, if some backyard inventor is not too scrupulous about destroying his mistakes and they propagate real good, Well. . . .

DAVID A. BRIDGER

St. Louis, MO
(Via Internet)

Dear Dr. Schmidt:

There has been a patent case in the news which makes the science fact article in the Mid-December 1994 *Analog* especially timely. Two separate claimants have filed patent applications for a human gene.

It is not clear from the reports whether a patent is being sought for the gene itself. If it is, then I guess I don't understand patent law very well. The U.S. Constitution (Article I, section 8, paragraph 8) gives Congress the power.

"To promote the progress of science and the useful arts, by securing to authors and inventors the exclusive rights to their respective writings



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

and discoveries."

A genetically engineered organism is certainly something new, and was made what it was by human art. However, the gene in question is neither new nor the product of human art. A claim on the METHOD used to discover the gene, fine. A claim on an organism in which the gene is artificially introduced, fine. But on the gene itself? It was in no sense "authored" or "invented" by its discoverers.

KURT FOSTER

(Via Internet)

*The author replies....*

Dear Stan:

A few days ago you sent me a copy of Kurt Foster's letter re my little essay, "The Bug, the Mouse, and Chapter 24." Coincidentally that same evening I watched a TV news report showing new research in DNA at the National Institutes of Health and at the Department of Energy (probably the biggest and best-subsidized players in this field). DOE demonstrated its automated facilities for synthesizing genes of one million nucleotides. NIH through its numerous subcontractors probably has comparable capabilities. According to my records the smallest human gene is the beta-globin with 1,720 base pairs. The biggest is dystrophin with 2 million. Certainly both the NIH and DOE have facilities for making human genes in this range. To my lay mind all this is absolutely marvelous.

But then we come to the question of patent claims, and Mr. Foster hit the nail on the head when he asks, what happened to the novelty requirement? He's quite right. It's black letter patent law (with certain oddball exceptions that don't apply here) that, no matter how you make it, if the resulting compound already exists you can't get a valid patent on it. Experienced attorneys know this. After some preliminary skirmishing, they drop back to Plan B, which in many cases is still good enough for solid commercial protection. This strategy was developed years ago for DDT and it still works. DDT was an old compound when its insecticidal properties were discovered, and hence was no longer patentable per se. So, how to patent it? Easy (I paraphrase); "Composition DDT and an inert diluent."

But suppose the new synthetic gene is not *precisely* identical to the natural gene? What then? If the differences are unobvious (and books have been written as to what is unobvious) our bio-inventor may have a chance. But he still has to run the statutory gauntlets, the main one being utility. What's his modified gene good for? Does it prevent disease? Regulate growth? Prevent hair loss? And so on. It's got to do something useful that its natural cousins can't do, or at least do what they're doing, but do it a lot better. We've seen examples of genuine utility in the field of plant genetic engineering, so we have every reason to expect beneficial uses for new synthetic human genes, modified or otherwise.

As regards filing a patent application involving a synthetic human gene we bear in mind the requirement for a full disclosure, i.e., the full sequence



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

printed out on paper (37 CFR 1.821[c]). For an average-size human gene of about one million nucleotides, printable at say 1,000 units per page of "metric" paper, we're looking at a thousand-page patent, known in the trade as a "block-buster," obtainable from the Patent Office only on a showing of special need. Fortunately it can be printed directly from the computer disk or tape (a required part of the disclosure). After grant and publication we doubt that the million-unit sequence as a whole will ever see the light of human eyes. Rather, it will enter another world, where it will be studied, analyzed, and dissected by other computers all over the world.

Since there are 100,000 human genes, we can look forward to a sizable library. Stay tuned!

CHARLES L. HARNESS

P.S. A word of explanation about the words "Chapter 24." In the Manual of Patent Examining Procedure its full name is "Chapter 2400 Biotechnology." However, in the trade it's simply (and reverentially) "24."

Dr. Schmidt,

I just received the Mid-December issue today and for the first time felt the need to write. Gregory Bennett in his response to Shawn Hurley wrote "Contrary to what you've heard, mosquitoes do transmit AIDS . . . two confirmed cases of HIV infection from mosquitoes in Houston, and several hundred possibles." He also states that he doesn't know how many more cases have been discovered since then because the information is kept in locked filing cabinets. I'm no conspiracy nut but I have to say that this sounds like "Big Brother" keeping information from those of us outside the loop. I remember a conversation I had several years ago with some friends who had watched a "Nightline" or "20/20" program with me. I stated at that time I would believe the scientist who had come on and said that AIDS could not be transmitted by mosquitoes when that same scientist put his arm into one of those mosquito boxes featured on insect repellant commercials along with an AIDS patient and not one minute before.

Bennett further states the theme of "The Last Plague" is not that we should shun those who have become infected by HIV, but quite the opposite. I don't feel that way at all. When I find out that someone I know has a communicable infection I stay the hell away until I am sure I won't be exposed to it. I do it to people who have the flu and I don't intend to behave differently towards people who have a far more serious condition.

I realize I am not politically correct in feeling this way but I'd rather choose my own risks and not have them imposed on me from outside without any chance to decide for myself whether I'd be willing to take that particular risk. I'm just glad I'm not a health care worker who has no right to know that the person they are treating may be carrying the AIDS virus. I think that the twisting and perverting of logic to arrive at the protection of the AIDS victims' rights above the rights of every other individual they may come into contact



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

with is far more dangerous to us as a country and a society than AIDS itself, and I do not take that threat lightly at all.

As John Cleese might say "Now for something completely different."

I read your editorial on the fads in education, which seems to be a popular subject with you (education, that is), and I thought I'd throw in my two cents worth on that subject also. By the time I was in kindergarten I was already an old hand at school work, since I read everything that my brother, two years older, brought home with him. As a matter of fact since I had some of the same teachers he did I sometimes had done the material once already, giving the teachers the idea I was smarter than was actually the case.

I think that one of the biggest problems we have in this country is the idea that every problem can be solved if we just throw enough money at it. The school here (in a town of 8,500) has enough computing power to put out your magazine and have enough left over to run a couple of computer-based businesses on the side. I'm not sure though that the teachers are using those computers to their best advantage. I recently helped a teacher at the middle school network three groups of six Mac LC 550's in her classroom and then installed the same software on all eighteen computers. Sort of blows one of the main reasons to network all to pieces.

I talked to another teacher who was looking to score some grant money for new computers and when I asked why the upgrade was needed was told "Well these would be new machines" not that the computers now being used were inadequate or couldn't handle the new software, they just weren't new anymore.

One of the people I remember most from my childhood was a teacher who read to us when I was in the first or second grade. There was no hi-tech then unless you count the film strips with the record player accompanying, but I would be willing to bet I learned more there in a shorter period of time than from some of the high dollar hi-tech stuff I've had available since then. She did it by getting my attention and holding it—something I think more teachers should be better at. I don't care what technology you work with; if the subject is made interesting to you, you will learn more, faster.

Keep up the good work, but give a thought to the font you use for *Analog* on the front cover, it looks goofy as all get out and takes up way too much of the space on the front cover, which should have as much of the cover art exposed as possible.

STEVE MOYER

Box 506

Nevada, MO 64772.

*As Ben Bova once said, "One of the best schools in history was a grove of olive trees with Socrates in it."* ■



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ANALOG/ASIMOV combination CLASSIFIED AD rate is $4.80 per word—payable in advance—($72.00 minimum). Capitalized words 60¢ per word additional. To be included in the next issue please send order and remittance to Judy Dorman, DELL MAGAZINES, 1540 Broadway, New York, N.Y. 10168-0035.

## ART AND DESIGN

ART PRINTS AND POSTERS BY KEITH PARKINSON. For information on prints by Parkinson and other artists, contact, Shadow Graphics, PO Box 199, Lititz, PA 17543.

## AVIATION

LISTEN!!! To airliners, air traffic control, corporate aircraft. Glossary and frequencies for your area, $12.95. Write: sras comm, PO Box 7, Andreas, PA 18211.

## BOOKS & PERIODICALS

100,000 science fiction and mystery paperbacks, magazines, hardcovers. Free catalogs! Pandora's, Box Z-54, Neche, ND 58265.

Astoundings, 1933-49, other sf magazines, books. Send SASE to Ted Serrill, 555 Old Post Rd. C-15, Edison, NJ 08817.

## PERSONAL

BEAUTIFUL BRITISH LADIES & ELIGIBLE BRITISH GENTLEMEN seek friendship, romance and marriage with Americans! All ages! Free details: ENGLISH ROSE INTRODUCTION AGENCY (Dept. AASF), 24 Cecil Square, Margate, Kent, CT9,1BA, ENGLAND. TEL/FAX: 01144-1843-290735 (24 Hours).


IN THE FUTURE

your classified/display ad can be placed

HERE

for details—
SF CLASSIFIED
1540 Broadway
New York, N.Y. 10036
212-782-8549



**"YOUR FREE CATALOG KNOCKED MY SOCKS OFF"**

Our free Catalog of free and low-cost government booklets will very likely impress you, too. But first you have to get it. Just send your name and address to:

**Consumer Information Center, Department KO, Pueblo, Colorado 81009**

A public service of this publication and the Consumer Information Center of the U. S. General Services Administration





LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# UPCOMING EVENTS Anthony Lewis

**24-28 August**
INTERSECTION (52rd World Science Fiction Convention) at Scottish Exhibition & Conference Centre, Glasgow, Scotland. Guest of Honour—Samuel R. Delany & Gerry Anderson, Fan Guest of Honour—Vin¢ Clarke, TMs—Peter Morwood & Diane Duane. Registration—£80/US$125/CDN$160/DM210/DFI 240, Supporting—£15/US$25/CDN$30/DM40/DFI 45. At-door rates not set as of the time of this listing but will be greater than current attending rates. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: Intersection, AdMail 336, Glasgow G2 1BR, UK or intersection@smof.demon.co.uk ; Intersection, Box 15430, Washington DC 20003-4030, USA. (301) 345-5186 voice/fax.

**8-10 September**
COPPERCON 15 (Phoenix area SF conference) at Day's Inn Airport, Phoenix, Ariz. Guest of Honor—Spider & Jeanne Robinson, Fan Guest of Honor—M. R. Hildebrand. Registration—$30 until 26 August, $35 at the door. Info: CopperCon 15, Box 82303, Phoenix AZ 85071-2303. (602) 973-2054.

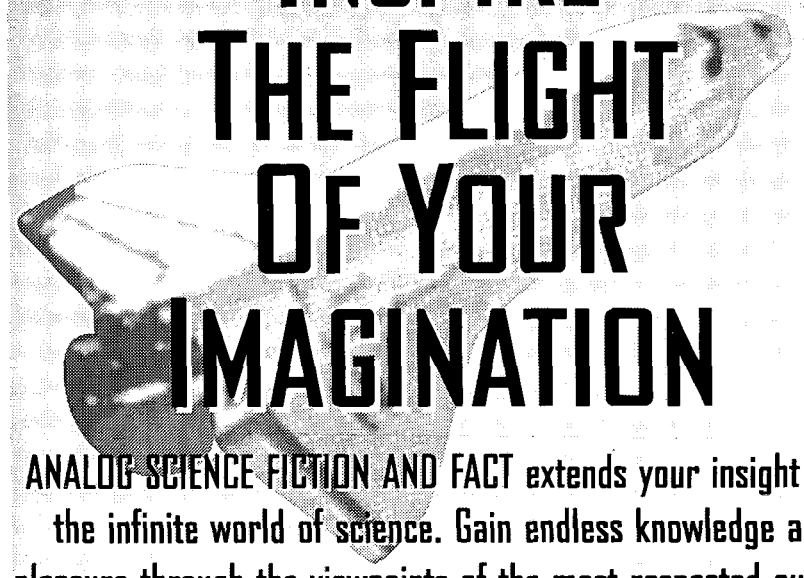
**29 Sep-1 Oct**
RISING STAR 4 (Virginia SF conference) at Salem, Va. Guest of Honor—Frederik Phol, Artist Guest of Honor—Frank Kelly Freas, Special Guest—Hal Clement. Registration: $17.50 until 1 August, $20 at the door. Info: Rising Star 4, 545 Howard Drive, Salem VA 24153. (703) 389-9400.

**29 Sep-1 Oct**
SILVERCON 4 (Las Vegas area SF conference) at Best Western Mardi Gras Inn, Las Vegas, Nev. Guests of Honor—Roger Zelazny and Bob Tucker. Registration $20 until 30 September, $25 at the door. Info: Silvercon 4, % Aileen Forman, POBox 95941, Las Vegas NV 89193-5941. (702) 896-6338.



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# INSPIRE THE FLIGHT OF YOUR IMAGINATION



ANALOG SCIENCE FICTION AND FACT extends your insight into the infinite world of science. Gain endless knowledge and pleasure through the viewpoints of the most respected authors in the science field. You'll find there are no limits to where your scientific imagination will take you!

**SUBSCRIBE TODAY!**

Receive 18 issues for only $30.97 and save over 34% off the newsstand price or for $22.97 receive 12 issues

HWNC8

Call toll free
1-800-333-4561

OR

mail your order to:
ANALOG
PO Box 5133, Harlan, IA 51593

Outside U.S. & Poss. 18 for $39.97, 12 for $27.97 (U.S. funds only, payment with order). Includes GST. Please allow 6-8 weeks for delivery of your first issue.
We publish double issues, in January and July. Each double issue counts as two towards your subscription.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

# MAIL ORDER MALL

**CALL TOLL FREE 1-800-722-9999**

## THE REVOLVING BOOKCASE— No Assembly Required

This elegant show-case for your favorite books or cassette library is crafted from hand-selected American pine. You'l want several for use in your den, family room, bedroom office, or in your living room as end tables. Mounted on a concealed ball-bearing base, this convenient bookcase rotates a full 360 degrees with only a touch and needs only 4" clearance. You have easy access to any of the 8 individual compartments, each a roomy 11" high x 9½" wide x 6" deep. It offers nearly 6 linear feet of easy-access space for storing your books, video tapes, audio cassettes collectibles, etc. Overall size is 26½"H 18½"W and 18½"D Available in either ready-to- finish, classic medium oak, o traditional deep mahogany finish.

| | | Price | S&H |
|---|---|---|---|
| A-1894 | Mahogany | $149.99 | $16.95 |
| A-1893 | Classic Oak | $169.99 | $16.95 |
| A-1892 | Cherry | $169.99 | $16.95 |
| A-1891 | Ready To Finish | $149.99 | $16.95 |

## TUSH CUSH

Are you one of the millions of Americans who suffer from low back pain? This scientifically designed seat works to relieve and prevent back pain in 2 ways: first, it suspends the tail bone (coccyx) in the air and reduces the pressure on and within the lower spinal discs; second, the unique wedge shape tips the pelvis forward to help restore the spine's natural lumbar curve. Constructed of highly resilient polyurethane foam, the "Tush Cush" comes with a removable, machine washable, dark brown cover. It measures 14"x18" and features a handle for easy toting. Perfect for home, office, auto, sporting events, theaters, wheelchairs or anywhere your "tush" needs a "cush"ion! **$39.98** ($5.75) #A1967.

## INNOVATIVE IONIZER

A sophisticated electronic device that use nature's way of cleaning air—emitting trillions of negatively charged ions that act like magnets attracting microscopi particles of dust, smoke and pollen. One belongs in every room, but sometimes a table top ionizer just isn't practica or desirable for reasons o space or your decor. This tin unit (1 1/2"x3") provides a ingenious solution, plug-gin right into any wall outlet where it will remai inconspicuous while per-forming its might task. Features "on" indicator light an collector pad that can be rinsed and eventually, replaced. By Pollenex, fo fresher air in home or office. **$39.98** ($4.95 #A1867. 2 for **$75.98** (7.95) #A1867/2.

**TO ORDER:** Send check with item number for total amount, plus shipping and handling payabl to **Mail Order Mall**, Dept. 095AN; P.O. Box 3006, Lakewood, N.J. 08701, or call **TOLL FRE 1-800-722-9999**. NJ residents add 6% sales tax. We honor MasterCard/Visa/Discover/AmEx. Sorr no C.O.D orders. Satisfaction guaranteed. 30 day money back guarantee for exchange or refund.

**CALL TOLL FREE TODAY 1-800-722-9999**

Magalog Marketing Group Inc. 1995 Advertisement 1905 Swarthmore Avenue, Lakewood NJ, 08701

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED